

HORTICULTURAL PHYSIOLOGY

HOS 6932 - 3 CREDITS

FALL 2015

The road to success is always under construction – Lily Tomlin

“The best thing for being sad,” replied Merlin, “is to learn something...Learn why the world wags and what wags it. That is the only thing which the mind can never exhaust, never alienate, never be tortured by, never fear or distrust, and never dream of regretting. Learning is the only thing for you. Look what a lot of things there are to learn” – T.H White, *The Once and Future King*

INSTRUCTOR: Dr. Rebecca L. Darnell
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OFFICE HOURS: By appointment

CLASS MEETING TIME & LOCATION: MWF 5th period. 2316 Fifield Hall.

COURSE DESCRIPTION: A broad-based, introductory course covering basic concepts and processes of plant physiology, including water relations, nutrient absorption, photosynthesis, respiration, carbohydrate partitioning, nutrition, and hormones.

COURSE OBJECTIVES: At the end of the course, students will be able to describe basic plant physiology concepts and how they relate to plant growth and development.

INSTRUCTIONAL METHOD: This is a lecture based course with no laboratory. PowerPoint is not typically used (except in rare cases); however, handouts using drawings, tables, and figures are used to illustrate concepts. Handouts will be posted on the course website.

WEB SITE: The course syllabus, handouts, and old exams are available at the following site:
<http://hos.ufl.edu/hos4304/>

Lecture notes will **NOT** be available on the web.

GRADING: Based on 2 exams (100 pts. each), a cumulative final (140 pts.), and 3 homework assignments (20 pts. each). Exam material will come from lectures and class discussions. Grading scale:

90-100	A	70-74	C
85-89	B+	65-69	D+
80-84	B	60-64	D
75-79	C+	<60	E

TEXT: Recommended: Taiz, L. and E. Zeiger. **2015.** *Plant Physiology and Development*. 6th edition, Sinauer Assoc., Inc. Older editions of this text are available; I can supply page numbers for readings in those if necessary.

There is a web site associated with this text, which has additional readings. See: www.plantphys.net.

HOMEWORK ASSIGNMENTS: 2-4 questions to be answered using lecture notes, reading materials, and/or other written sources. Homework assignments will be handed out and due on the following dates:

<u>Handout</u>	<u>Due</u>
9/16/2015	9/18/2015
10/14/2015	10/16/2015
11/18/2015	11/20/2015

Homework assignments must be turned in at the beginning of class on the due date. Late assignments WILL NOT be accepted.

JOURNAL CLUB: In order to obtain graduate credit for this course, you must complete a presentation and a critical review of journal articles in an area pertaining to a subject area we cover in this course. This will be done at a separate time (outside of lecture time) and attendance of all graduate students is required. To begin, we will meet to discuss how to critically review an article. Then, I will present a critical review to you as an example. I will then help each of you select articles (hopefully that pertains to your research) for you to present and critically analyze in a journal club format. Thus, we must plan on meeting extra hours outside of lecture time during the course of the semester.

This extra assignment will be worth 100 points, and so the point total for the course will be 500 (instead of the 400 for undergraduates).

COURSE POLICIES: Class attendance is the student's responsibility. Keep in mind, however, that exam questions come from lectures and class discussions. Class participation is highly encouraged!

Make-up exams will be given only for documented emergencies.

CLASSROOM DECORUM: Cellular and other types of communications devices must be turned off during class (if it buzzes, beeps, chimes, plays music, or makes any other sound, turn it off). Please keep reading of newspapers and other non-class materials reserved for an appropriate location such as the lounge area in this building.

If you come in late to class or have to leave early, please sit in the back so as not to disturb the other members of the class.

UF POLICIES:

UNIVERSITY POLICY ON ACCOMMODATING STUDENTS WITH DISABILITIES: The Dean of Students Office (<http://www.dso.ufl.edu/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. **Students requesting accommodation for disabilities must first register with the Dean of Students Office.** The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

UNIVERSITY POLICY ON ACADEMIC MISCONDUCT: Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at <http://www.dso.ufl.edu/students.php>.

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.

CAMPUS RESOURCES: Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. 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 Rd. 352-392-1575
<http://www.counseling.ufl.edu/cwc/>
- *Career Resource Center*, CR-100 JWRU, 392-1602, www.crc.ufl.edu/

HOS 6932 - FALL 2015
Horticultural Physiology
Tentative lecture schedule

<u>Date</u>	<u>Topic</u>	<u>Reading</u>
Aug. 24 26, 28	Introduction Organization of Plant Growth Cell Tissue Tissue systems Morphological structures	p. 5-34; 39-48
31 Sept. 2, 4	Organic Compounds Proteins/Enzymes Enzyme kinetics, Michaelis-Menten plots Factors influencing rates of enzymatic reactions	www.plantphys.net (Appendix 1, p. A1-10 to A1-21)
Sept. 7	No Class - Labor Day	
9 11, 14	Enzymes (cont.) Water Relations Water potential Water movement	p. 83-97
16, 18	Transpiration Transpirational flux equation Stomatal mechanism Factors influencing transpiration Daily patterns of transpiration	p. 99-117 p. 269-276
21, 23, 25	Nutrient Absorption/Solute Transport Nutrient movement from soil to leaf Membrane transport proteins Mechanisms of absorption	p. 142-167
28	EXAM I	
30	Nitrogen Metabolism	p. 353-360
Oct. 2	Photosynthesis – Overview	
5, 7	Light reaction	p. 171-198
9, 12, 14	CO ₂ fixation reactions C3 Photorespiration C4 CAM	p. 203-211 p. 211-220 p. 220-228 p. 228-230
16, 19	Factors affecting photosynthesis	p. 245-264
21, 23, 26	Carbohydrate partitioning Sucrose/starch synthesis Phloem loading	p. 230-242 p. 300-305

		Phloem translocation	p. 285-300
		Phloem unloading	p. 305-308
		Sink allocation	p. 309-311
Oct.	28	EXAM II	
	30	Respiration	
Nov.	2, 4	Glycolysis, Citric Acid Cycle, Electron Transport (ET)/ATP synthesis	p. 317-342
		Alternative ET	
		Factors affecting respiration	p. 342-343
	6	No Class - Homecoming	
	9	Gene Expression	p. 62-78
	11	No Class – Veteran’s Day	
	13	Signal Transduction	p. 407-414
	16, 18	Hormones & Plant Development	p. 414-421
	20, 23	Hormone Signaling	p. 431-445
	25, 27	No Class- Thanksgiving	
	30	Phytochrome	p. 447-463
Dec.	1	Phytochrome (cont.)	
	3, 7,9	TBD	

Final exam: Fri., Dec. 18, 12:30-2:30 p.m.