

HORTICULTURAL PHYSIOLOGY

HOS 4304 - 3 CREDITS

FALL 2016

“Animals can walk around but plants have to stay still to do the same things with ingenious mechanisms – plants are extraordinary” – Barbara McClintock

“It is important that students bring a certain ragamuffin, barefoot irreverence to their studies; they are not here to worship what is known, but to question it.” - Jacob Bronowski, The Ascent of Man

INSTRUCTOR: Dr. Rebecca L. Darnell
1131 Fifield Hall
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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. There is a website 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>
9/14/2016	9/16/2016
10/12/2016	10/17/2016
11/16/2016	11/18/2016

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

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 or illnesses, observation of religious holidays, or participation in official university functions.

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 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:

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/

STUDENTS WITH DISABILITIES: The Disability Resource Center 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.

- 0001 Reid Hall, 392-8565, www.dso.ufl.edu/drc/

COMPLAINTS POLICY: The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy. A student who is unsure as to the official responsible for handling his or her particular complaint may contact the Ombuds office or the Dean of Students Office. For complaints that are not satisfactorily resolved at the department level or which seem to be broader than one department, students are encouraged to submit those complaints to one of the following locations:

- *Ombuds*, 31 Tigert Hall, 352-392-1308, <http://www.ombuds.ufl.edu>
- *Dean of Students Office*, 202 Peabody Hall, 352-392-1261, <http://www.dso.ufl.edu>

HOS 4304 - FALL 2016
Horticultural Physiology
 *Tentative lecture schedule

<u>Date</u>	<u>Topic</u>	<u>Reading</u>
Aug. 22	Introduction	
24, 26	Organization of Plant Growth Cell Tissue Tissue systems Morphological structures	p. 5-34; 39-48
29	Organic Compounds	
31	Proteins/Enzymes	
Sept. 2	Enzyme kinetics, Michaelis-Menten plots Factors influencing rates of enzymatic reactions	www.plantphys.net (Appendix 1, p. A1-10 to A1-21)
5	No Class - Labor Day	
7	Enzymes (cont.)	
9, 12	Water Relations Water potential Water movement	p. 83-97
14, 16	Transpiration Transpirational flux equation Stomatal mechanism Factors influencing transpiration Daily patterns of transpiration	p. 99-117 p. 269-276
19, 21, 23	Nutrient Absorption/Solute Transport Nutrient movement from soil to leaf Membrane transport proteins Mechanisms of absorption	p. 142-167
26	Nitrogen Metabolism	p. 353-360
28	EXAM I	
30	Photosynthesis – Overview	
Oct. 3, 5	Light reaction	p. 171-198
7, 10, 12	CO ₂ fixation reactions C3 Photorespiration C4 CAM	p. 203-211 p. 211-220 p. 220-228 p. 228-230
14	No Class - Homecoming	
17, 19	Factors affecting photosynthesis	p. 245-264
21, 24, 26	Carbohydrate partitioning Sucrose/starch synthesis	p. 230-242

		Phloem loading	p. 300-305
		Phloem translocation	p. 285-300
		Phloem unloading	p. 305-308
		Sink allocation	p. 309-311
Oct.	28	EXAM II	
	31	Respiration	
Nov.	2, 4	Glycolysis, Citric Acid Cycle, Electron Transport (ET)/ATP synthesis	p. 317-342
		Alternative ET	
		Factors affecting respiration	p. 342-343
	7, 9	Gene Expression/Signal Transduction	p. 62-78; 407-414
	11	No Class – Veteran’s Day	
	14, 16	Hormones & Plant Development	p. 414-421
	18, 21	Hormone Signaling	p. 431-445
	25, 27	No Class- Thanksgiving	
	28, 30	Phytochrome	p. 447-463
Dec.	2, 5, 7	TBD	

Final exam: Wed., Dec. 14, 3:00 – 5:00 p.m.

*This is a tentative schedule, based on previous semesters; topics and dates may be adjusted. Students will be notified in class of any changes to the course schedule.