HORTICULTURAL PHYSIOLOGY

HOS 4304 - 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
1131 Fifield Hall
273-4789
rld@ufl.edu

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:

<table>
<thead>
<tr>
<th>Score</th>
<th>Grade</th>
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<tbody>
<tr>
<td>90-100</td>
<td>A</td>
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<tr>
<td>85-89</td>
<td>B+</td>
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<tr>
<td>80-84</td>
<td>B</td>
</tr>
<tr>
<td>75-79</td>
<td>C+</td>
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<tr>
<td>70-74</td>
<td>C</td>
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<tr>
<td>65-69</td>
<td>D+</td>
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<tr>
<td>60-64</td>
<td>D</td>
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<tr>
<td>&lt;60</td>
<td>E</td>
</tr>
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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:

<table>
<thead>
<tr>
<th>Handout</th>
<th>Due</th>
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<tbody>
<tr>
<td>9/16/2015</td>
<td>9/18/2015</td>
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<tr>
<td>10/14/2015</td>
<td>10/16/2015</td>
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<tr>
<td>11/18/2015</td>
<td>11/20/2015</td>
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Homework assignments must be turned in at the beginning of class on the due date. 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.

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/
### Tentative lecture schedule

**Date** | **Topic** | **Reading**
--- | --- | ---
Aug. 24 | Introduction |  
26, 28 | Organization of Plant Growth  
Cell  
Tissue  
Tissue systems  
Morphological structures | p. 5-34; 39-48
31 | Organic Compounds |  
Sept. 2, 4 | Proteins/Enzymes  
Enzyme kinetics, Michaelis-Menten plots  
Sept. 7 | **No Class - Labor Day** |  
9 | Enzymes (cont.) |  
11, 14 | 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  
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 | CO₂ 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.