

ADVANCED HORTICULTURAL PHYSIOLOGY

**HOS 6932 - 3 CREDITS
SPRING 2018**

INSTRUCTOR: R. L. Darnell
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OFFICE HOURS: By appointment.

CLASS MEETING TIME & LOCATION: MWF 3rd period. 2316 Fifield Hall.

COURSE DESCRIPTION: A whole-plant physiology course covering vegetative and reproductive biology and environmental effects on plant growth and development. Culture and management of specific crops will not be covered.

COURSE OBJECTIVES: At the end of the course, students will 1) understand environmental influences on plant growth and development and the relationship to basic physiological processes and 2) gain an appreciation for structure and function of the whole plant.

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.

PREREQUISITE: HOS 4304 OR BOT 3503

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 |

FINAL EXAM: Thursday, May 3, 12:30-2:30 p.m.

TEXT: None required. Recommended: Taiz, L. and E. Zeiger, 2015. *Plant Physiology*. 6th edition, Sinauer Assoc., Inc. There is a web site associated with this text, which has additional readings. See: www.plantphys.net.

HOMEWORK ASSIGNMENTS: Short answer questions to be answered independently, 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> |
|----------------|------------|
| 1/24/18 | 1/26/18 |
| 2/21/18 | 2/23/18 |
| 4/2/18 | 4/4/18 |

Homework assignments must be uploaded to Canvas by midnight on the due date as a Word doc. 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 weekly meeting** 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: The course syllabus, handouts, homework assignments, and old exams will be available on Canvas. Lecture notes will **NOT** be available.

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:

Students requesting accommodation for disabilities must first register with the Dean of Students Office (<http://www.dso.ufl.edu/drc/>). 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 HELPING 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/

HOS 6932 - Spring 2018
Advanced Horticultural Physiology
Tentative Lecture Schedule

| <u>Date</u> | <u>Topic</u> | <u>Reading</u> |
|--------------------|--|---------------------|
| Jan. 8 | I. Introduction | |
| | II. Growth and Development | |
| | A. Vegetative Growth | |
| 10 | 1. Seed structure, development, germination | p. 514-528 |
| 12 | 2. Juvenility/Maturation | p. 591-594 |
| | Seasonal vegetative growth - shoot/root growth | |
| 15 | NO CLASS - Martin Luther King, Jr. Day | |
| 17 | 3. Dormancy | |
| | Types | |
| | Onset/Release | |
| | Chilling Requirement | |
| | Heat Unit Requirement | |
| 19, 22, 24 | Dormancy (continued) | |
| | B. Reproductive Growth | |
| 26, 29 | 1. Flower Bud Initiation | |
| | Photoperiod | p. 594-605 |
| | Vernalization | p. 605-608 |
| 31 | Genetics of FBI | p. 608-615 |
| Feb. 2 | 2. Flowering | |
| 5 | 3. Fruit Set and Growth | |
| 7 | 4. Maturation/Ripening | |
| 9 | EXAM I | |
| | III. Environment | |
| | A. Solar radiation | |
| 12 | 1. Specific heat, heat of fusion, heat of vaporization | |
| 14 | 2. Factors affecting distribution of solar radiation | |
| | B. Temperature relations | |
| 16, 19, 21, 23, 26 | 1. Growing Season | p. 736 |
| | Thermoperiodism/DIF | |
| | Root/shoot temperatures | |
| | Chilling Injury | p. 752-753 |
| 28, Mar. 2 | 2. Dormant Season | |
| | Freezing | p. 737; 754-755 |
| Mar. 5-9 | SPRING BREAK | |
| | C. Light Relations | |
| 12 | 1. Photomorphogenesis/Phototropins/ Cryptochromes | p. 462-473; 535-536 |

| | | |
|--------------|--|---------------------------------|
| 14 | 2. Phytochrome | p. 447-463 |
| 16 | EXAM II | |
| 19, 21, 23 | 3. Light relations within plant canopy Quantity vs Quality Shade effects within canopy | p. 540-542 |
| 26 | 4. Modification of Light Environment | |
| | D. Water Relations | |
| 28, 30 | 1. Flooding | p. 737; 749-750 |
| Apr. 2, 4, 6 | 2. Drought | p. 735-736; 748-749; 755-758 |
| 9, 11 | 3. Growth Control via Water | |
| Apr. 13-25 | TBD | |

Final Exam: Thursday, May 3, 12:30-2:30 p.m.