



HOS 4341

ADVANCED HORTICULTURAL PHYSIOLOGY

3 CREDITS – SPRING 2020

Instructor: DR. LORENZO ROSSI, Dept. of Horticultural Sciences
UF/IFAS Indian River Research and Education Center
2199 S Rock Rd., Fort Pierce, Florida, 34945

Contact Information:

- Email: use the Canvas e-mail (the most efficient) or l.rossi@ufl.edu
- Phone: (772) 577-7341.
- Office hours: online conferencing via canvas/zoom every Friday 11am-12pm (or by request)
- Usually replies in 24 hrs

Lectures: 100% Online course. Each week there is a block of content available with specific due dates.

Course Description: This is whole-plant physiology course for undergraduate students covering vegetative and reproductive biology and environmental effects on plant growth and development.

Course prerequisites: HOS 4304 or BOT 3503

Knowledge prerequisites: This is an advanced course which examines the interactions between plant physiology the environment. To be successful, students should have a general knowledge of biology, botany, microbiology, and soil chemistry.

LEARNING OBJECTIVES

After successful completion of this course, students will be able to:

- Explain environmental influences on plant growth and development
- Describe the relationship between basic physiological processes and the environment
- Gain an appreciation for structure and function of the whole plant.

Recommended textbooks

- 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

EVALUATION OF LEARNING

Assignment	% of grade	Points
1) 15 Quizzes	40	900
2) First Exam	10	225
3) Mid-Term Exam	10	225
4) Final Exam	10	225
5) Final project	30	675
Total	100	2250

Quizzes

At the end of each module a specific quiz will assess the students learning. 10 questions related to module will be available. Students will have 2 possible attempts. 6 points will be available for each question, for a total of 60 points per quiz.

Exams	Content covered
1) First Exam	Modules 1-5
2) Mid-Term Exam	Modules 6-10
3) Final Exam	Modules 11-15

All the three exams will have 9 questions. 25 points will be available for each question, for a total of 225 points. Students will have 7 days to start the exam and, once they started, they will have 24 hrs to complete it.

Final project

Students will form teams; each team will tackle a well-defined research project during the course. A list of suggested project topics will be provided. All projects are subjected to approval by the instructor. The project component will include a short-written project proposal (due 2/17/2020), a short mid-term project report (due 3/30/2020), a final project report and presentation (due 4/30/2020). Each component adds some significant element to the final grade, and the overall project grade will be based on the quality of each component of your work. The above project components are due to the instructor via canvas.

Assignment breakdown	Points x Number of assignments = Total Points
15 Quizzes	$60 \times 15 = 900$
3 Exams	$225 \times 3 = 675$
Final project	675
Total	2250

Critical dates

First Exam	2/14/2020	(Modules 1-5)
Mid Term Exam	3/23/2020	(Modules 6-10)
Final Exam	4/27/2020	(Modules 11-15)

Short-written project proposal	2/17/2020
Short mid-term project report	3/30/2020
Final project report and presentation	4/30/2020

GRADING SCALE

A	=	94 - 100 %	C	=	< 77 - 74 %
A-	=	< 94 - 90 %	C-	=	< 74 - 70 %
B+	=	< 90 - 87 %	D+	=	< 70 - 67 %
B	=	< 87 - 84 %	D	=	< 67 - 64 %
B-	=	< 84 - 80 %	D-	=	< 64 - 61 %
C+	=	< 80 - 77 %	E	=	< 61 %

Passing Grade Points

A	4.0
A-	3.67
B+	3.33
B	3.0
B-	2.67
C+	2.33
C	2.0
C-	1.67
D+	1.33
D	1.0
D-	0.67
S	0

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 organization

The module material of a given week will be made available the Friday of the week before. The assignments will be due on the Friday of a given module week.

Module 1: Growth and development: Vegetative growth (seed structure, development, germination)

Module 2: Growth and development: Vegetative growth (juvenility, maturation, seasonal vegetative growth)

Module 3: Growth and development: Vegetative growth (dormancy types, onset, release, chilling requirements)

Module 4: Growth and development: Reproductive growth (adult reproductive phase, FBI, photoperiod)

Module 5: Growth and development: Reproductive growth (vernalization, causes of FBI, floral development)

Module 6: Growth and development: Reproductive growth (fruit set, development, maturation/ripening)

Module 7: Environment: Solar radiation (specific heat, heat of fusion, heat of vaporization, greenhouse effect)

- Module 8:** Environment: Solar radiation (factors affecting distribution of solar radiation)
- Module 9:** Environment: Temperature relations (thermoperiodism/DIF, root/shoot temperature, HSPs)
- Module 10:** Environment: Temperature relations (dormant season and freezing)
- Module 11:** Environment: Light relations (freezing, chilling injury, mechanisms of chilling injury)
- Module 12:** Environment: Light relations (photomorphogenesis, phototropins, cryptochrome, phototropisms)
- Module 13:** Environment: Light relations (phytochrome and circadian rhythms)
- Module 14:** Environment: Light relations (light relations within plant canopy)
- Module 15:** Environment: Water relations (growth control via water, flooding, drought)

Course schedule

- 1/6/2020 Module 1 - Introduction to the course
- 1/8/2020 Module 1 – Growth and development: Vegetative growth (seed structure, development)
- 1/10/2020 Module 1 – Growth and development: Vegetative growth (seed germination)
- 1/13/2020 Module 2 – Growth and development: Vegetative growth (juvenility)
- 1/15/2020 Module 2 – Growth and development: Vegetative growth (maturation)
- 1/17/2020 Module 2 – Growth and development: Vegetative growth (seasonal vegetative growth)
- 1/20/2020 NO CLASS, Martin Luther King, Jr. Day**
- 1/22/2020 Module 3 – Growth and development: Vegetative growth (dormancy: types, onset/release)
- 1/24/2020 Module 3 – Growth and development: Vegetative growth (dormancy: chilling/heat requirements)
- 1/27/2020 Module 4 – Growth and development: Reproductive growth (plant reproductive strategies)
- 1/29/2020 Module 4 – Growth and development: Reproductive growth (adult reproductive phase)
- 1/31/2020 Module 4 – Growth and development: Reproductive growth (FBI and photoperiod)
- 2/3/2020 Module 5 – Growth and development: Reproductive growth (vernalization)
- 2/5/2020 Module 5 – Growth and development: Reproductive growth (causes of FBI)
- 2/7/2020 Module 5 – Growth and development: Reproductive growth (floral development and pollination)
- 2/10/2020 Module 6 – Growth and development: Reproductive growth (fruit set)
- 2/12/2020 Module 6 – Growth and development: Reproductive growth (fruit development and maturation)
- 2/14/2020 First Exam (Modules 1-5)**

2/17/2020	Module 7 – Environment: Solar radiation (specific heat, heat of fusion)
2/19/2020	Module 7 – Environment: Solar radiation (heat of vaporization)
2/21/2020	Module 7 – Environment: Solar radiation (incoming radiation and greenhouse effect)
2/24/2020	Module 8 – Environment: Solar radiation (factors affecting distribution of solar radiation/1)
2/26/2020	Module 8 – Environment: Solar radiation (factors affecting distribution of solar radiation/2)
2/28/2020	Module 8 – Environment: Solar radiation (factors affecting distribution of solar radiation/3)
3/2/2020	NO CLASS, Spring Break 😊
3/4/2020	NO CLASS, Spring Break 😊
3/6/2020	NO CLASS, Spring Break 😊
3/9/2020	Module 9 – Environment: Temperature relations (growing season: thermoperiodism/DIF)
3/11/2020	Module 9 – Environment: Temperature relations (growing season: root/shoot temperatures)
3/13/2020	Module 9 – Environment: Temperature relations (growing season: high temperatures and HSPs)
3/16/2020	Module 10 – Environment: Temperature relations (dormant season: freezing/1)
3/18/2020	Module 10 – Environment: Temperature relations (dormant season: freezing/2)
3/20/2020	Module 10 – Environment: Temperature relations (dormant season: freezing/3)
3/23/2020	Mid-Term Exam (Modules 6-10)
3/25/2020	Module 11 – Environment: Temperature relations (chilling injury/1)
3/27/2020	Module 11 – Environment: Temperature relations (chilling injury/2)
3/30/2020	Module 12 – Environment: Light relations (photomorphogenesis)
4/1/2020	Module 12 – Environment: Light relations (phototropins)
4/3/2020	Module 12 – Environment: Light relations (cryptochromes)
4/6/2020	Module 13 – Environment: Light relations (phytochrome/1)
4/8/2020	Module 13 – Environment: Light relations (phytochrome/2)
4/10/2020	Module 13 – Environment: Light relations (phytochrome/3)
4/13/2020	Module 14 – Environment: Light relations (plant canopy: quantity vs quality)

- 4/15/2020 Module 14 – Environment: Light relations (shade effects within canopy)
- 4/17/2020 Module 14 – Environment: Light relations (modification of light environment)
- 4/20/2020 Module 15 – Environment: Water relations (growth control via water)
- 4/22/2020 Module 15 – Environment: Water relations (flooding, drought)
- 4/27/2020 Final Exam (Modules 11-15)**

COURSE POLICIES

Attendance and Make-up Policy

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

- *UF Attendance policy*, <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action.

- For more information regarding the Student Honor Code, please see:
<http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code>

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.

Services for Students with Disabilities

Students with disabilities requesting accommodations should first register with the Disability Resource Center by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

- *Disability Resource Center*, 0001 Reid Hall, (352) 392-8565, www.dso.ufl.edu/drc/

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 Road, 392-1575, www.counseling.ufl.edu
 - Counseling Services
 - Groups and Workshops
 - Outreach and Consultation
 - Self-Help Library
 - Wellness Coaching
- *U Matter We Care*, www.umatter.ufl.edu
- *Sexual Assault Recovery Services (SARS)*, Student Health Care Center, 392-1161.
- *University Police Department*, 392-1111 (or 9-1-1 for emergencies), www.police.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, <https://career.ufl.edu/>

Course Evaluation Process

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 feedback on the quality of instruction in this course using a standard set of university and college criteria. Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals.

Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>.

Evaluations are typically open during the last two or three weeks of the semester. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>.

Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>

Student Complaints

You can file and resolve any complaints about your experience in this course in the following site:

- *Student complaints in residential courses*, <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>
 - *Student complaints in online courses*, <http://distance.ufl.edu/student-complaint-process/>