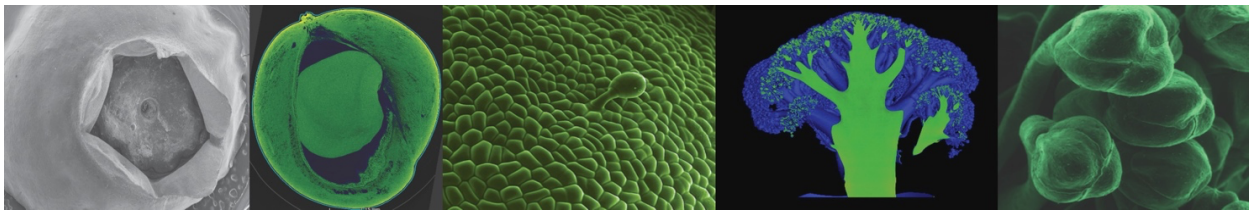

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OFFICE HOURS

TUESDAY: 2:30 - 4:30 PM.

Please make an appointment if you need to meet outside of these times.

Office - Room 1213 Fifield Hall;

HOS 6331 Postharvest Biology 2025 Spring

HOS 6331 Postharvest Biology 2025 Spring

(Jan 16 - Apr 23)

M 12:50-1:45 (50 min), W 12:50-2:45 (100 min), FIF 1304 & Zoom:

https://ufl.zoom.us/j/92852556286?pwd=OLb4Eu0wWzfBQxfOrfQMMdLJehvpJk.1

GENERAL DESCRIPTION

HOS 6331- Postharvest Biology – (3) Physiological, biochemical, and molecular aspects of senescence and ripening of harvested fruit and vegetative organs. Literature based discussions of current theories and research on cellular processes relevant to the storage and quality maintenance of harvested plant organs. Offered Spring semester, odd-numbered years.

COURSE SUBJECTIVES

1.To familiarize students with the relationships between plant organ type, function, and the relevance of these attributes to predictive postharvest behavior and handling protocols.
2.To familiarize students with organ type and function, and of the cellular implications of these attributes as they influence performance in the postharvest environment.
3.To familiarize students with current literature in postharvest science, addressing critical thinking skills required to adequately judge and evaluate the relevance of scientific findings.

OVERVIEW OF TOPICS

Physiology, biochemistry, and molecular biology of fruit and vegetative senescence following harvest. Mechanisms contributing to senescence and deterioration phenomena including unscheduled forms of programmed cell death (PCD) associated with abiotic and biotic storage disorders. Membrane and cell wall metabolism, low-temperature injury, reactive oxygen species, apoptotic-driven death phenomena, ethylene biosynthesis, reception, and signal transduction, controlled-atmosphere storage, and postharvest pathology.

HOS 6331 Postharvest Biology 2025 Spring (Jan 16 - Apr 23)

Week	Lecture Topics	Lecturer
Week 1 Jan 16, 17	Overview of postharvest biology **Molecular postharvest biology**	Liu
Week 2 Jan 22	Subjective vs. objective, destructive vs. nondestructive	Sargent
Week 3 Jan 27, 29	Quality attributes and maturity/harvesting indices	Brecht
Week 4 Feb 3, 5	Fresh-cut fruits and vegetables, Fresh fruit flavor and aroma	Brecht
Week 5 Feb 10, 12	Membrane structural/functional changes in senescing organs (Gene Editing/CRISPR) **Stress in harvested products**	Liu
Week 6 Feb 17, 19	Cell death processes in harvested plants and plant organs (Genomics) **A multidimensional systems biology analysis of cellular senescence**	Liu
Week 7 Feb 24, 26	Reactive oxygen species: signaling in senescence and aging (Phenomics) **Plant bioactive compounds in pre- and postharvest management**	Liu
Week 8 Mar 3, 5	Potato tuber dormancy and postharvest sprout control (proteomics) **Source-sink development in potato** **Mid-term exam**	Liu
Week 9 Mar 10, 12	Ethylene biosynthesis and signal transduction **Genetic modification of ethylene biosynthesis/perception/signaling**	Liu
Week 10 Mar 17, 19	**Spring Break**	
Week 11 Mar 24, 26	Fruit postharvest physiology and fruit softening (Metabolomics) **Molecular breeding for fruit quality**	Liu
Week 12 Mar 31, Apr 2	Harvest and postharvest processing of medicinal plants (Nanoparticles) **Fruit flavor, volatile metabolism**	Liu
Week 13 Apr 7, 9	Advances in postharvest treatments and technologies (ML) **Machine learning in postharvest biology. Written assignment due**	Liu
Week 14 Apr 14, 16	Growth kinetics, sink activity, and consequences of maturity at time of harvest	Ritenour
Week 15 Apr 21, 23	Postharvest pathology: latency, quiescence infection progression and host responses, symptom expression	Ritenour
Apr 28	**Final Exam**	Liu

TEXT

There are no required texts. Readings will focus on current postharvest-related literature. Selected readings will be distributed in class or provided via electronic means. Many of the assigned readings can be obtained on selected e-journal-based locations. Readings will be assigned at least one week in advance of scheduled in-class discussions.

Resource texts for individuals involved in postharvest research

Advances in Post-Harvest Treatments and Fruit Quality and Safety, Vázquez, M., Ramírez, J.A., eds., 2011. Nova Science Publishers, New York. Emphasizes technology over fundamental postharvest biology but contains a number of excellent contributions from different authors. Currently about $150.00.

Annual Plant Reviews, Senescence Processes in Plants, Susheng, G (ed.), 2007, Wiley-Blackwell. An excellent treatise of senescence biology, with emphasis on biochemical and molecular aspects but heavy bias (≈80%) toward vegetative systems.

Plant Cell Death Processes, Larry Nooden (ed.), 2004, Elsevier (Academic Press). This is an excellent book addressing not only traditional concepts and views of senescence, ranging from cellular to organismic, but programmed cell death (PCD) as well.

Postharvest Biology, Kays, S., Paull, R., 2004, Exon Press. A wide-spectrum treatment of the discipline of postharvest science. Subjects range from very applied to very basic.

Postharvest: An introduction to the physiology and handling of fruit, vegetables and ornamentals, 5th Edition, R. Wills, B. McGlasson, D. Graham, D. Joyce (Authors), 2007, University of New South Wales Press. A very introductory-level textbook that might be helpful to those with limited exposure to postharvest science. Emphasizes fundamental biological and technological principles important in the storage of fruit, vegetative and floral organs. Also reasonably priced, about $50.00!

Postharvest Biology and Technology of Fruits, Vegetables, and Flowers. G. Paliyath, D. Murr, A. Handa, S. Lurie (Eds.). 2008. Pricey ($200.00), and individual chapters range from very good to equally bad, depending on the author (s).

Postharvest Oxidative Stress in Horticultural Crops, Hodges, D. (ed.), 2003, Food Products Press, NY. An excellent but highly focused text dealing with sources of and defenses against oxidative stress encountered in the postharvest environment.

Biochemistry of Fruit Ripening, Seymour and Taylor (eds.) 1993, Chapman and Hall, London. Although this has become dated, it remains an excellent source of introductory and historical information on many topics of relevance to postharvest science. The book is fruit centric, with each chapter devoted to a different fruit type.

Course Readings

These will be assigned as needs arise. **Please note that 10% of the course grade will be determined on the basis of student participation (participation in in-class**

discussions). Students will be expected to have read all assigned readings **prior** to coverage of the material in class.

Student Evaluation

Midterm exams (20%, scheduled at approximately 6 weeks into the semester), final exam (20%), class participation (10%), written assignment (20%) and an oral presentation/critique of a contemporary topic in postharvest science (30%). Additional details of this assignment are described below.

Exams

The dates of the exams will be announced at least one week in advance. Letter grade assignments will depend on the performance of the class as a whole, but will be no stricter than ≥ 90 = A; ≥ 80, < 90 = B, etc. Students missing scheduled exams due to excused absences will be permitted to perform make-up exams at a time and place arranged between the student and instructor.

Written Assignment

Two pages, font size 12, single spaced (~1000 words).
Read and summarize 5 or more papers in the topics area on molecular studies, include one figure to support the summary.
Due on Apr 9, 2025.

Class Assignment and Oral Presentation

At the start of the semester, each student will be required to select a topics on postharvest biology that will provide the focal point for a 25 min presentation by the students. The presentation will be followed by a question/discussion session, with the student, with the assistance of the instructor, serving as discussion leader. Scheduling of the presentations will commence as early in the semester as possible. Topics will be selected by the student but confer with the instructor to avoid redundancy in topic selections. ***Examples of acceptable topics:*** postharvest issues as affected by organ morphology, developmental status at harvest, respiratory patterns after harvest, maturity indices, ethylene production/sensitivity, senescence patterns including programmed cell death, controlled-atmosphere storage and tolerance, pathogens, pigment changes, unique secondary metabolites, etc.

Attendance

Class attendance is mandatory and will be used as one index of student participation and evaluation. Special circumstances necessitating absences must be arranged in advance or, in the event of an emergency, explained upon return.

Academic Honesty, Software Use, Services for Students with Disabilities, UF Counseling Services

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:

Software Use:

All faculty, staff and students at 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.

- *University Counseling & Wellness Center*, 3190 Radio Road, 352-392-1575,

www.counseling.ufl.edu/cwc/

Counseling Services, Groups and Workshops, Outreach and Consultation

Self-Help Library, Training Programs, Community Provider Database

- *Career Resource Center*, First Floor JWRU, 392-1601, **www.crc.ufl.edu/**

Services for 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. Students requesting classroom accommodation 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 0001 Reid Hall , 352-392-8565, **www.dso.ufl.edu/drc/**

Student Complains

You can file and resolve any complaints about your experience in this course in the following site:
• Residential Course: https://sccr.dso.ufl.edu/policies/student-honor-code-studentconduct-code/.
• Online Course: http://www.distance.ufl.edu/student-complaint-proces

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.
Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.
Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring.
Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Recording
Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are
(1) for personal educational use,
(2) in connection with a complaint to the university, or
(3) as evidence in, or in preparation for, a criminal or civil Syllabus – 05 proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.
A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.
Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or

discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code. Policies regarding student in-class recordings are detailed here http://aa.ufl.edu/policies/in-class-recording/.