



Principles of Postharvest Horticulture

HOS4332C & HOS5085C

Spring 2024 - 3 CREDITS

MEETING TIMES AND LOCATION

Students view web-based lecture and demonstration materials and participate in a weekly discussion session (**Wednesdays, 2 – 3 p.m.**) conducted by videoconferencing.

INSTRUCTORS

Dr. Jeffrey K. Brecht

1217 Fifield Hall

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Dr. Mark Ritenour

IRREC – Ft. Pierce

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Office hours Mondays 3:00PM- 5:00PM, but students are encouraged to contact instructors via e-mail or phone outside of office hours whenever questions are encountered.

COURSE DESCRIPTION

This course covers the biological principles involved in harvesting, grading, packaging, transportation, and marketing horticultural crops, and their effects on quality maintenance. Commercial postharvest practices are described and explained in relation to general procedure and technology as well as the recommended postharvest best handling practices and optimum postharvest conditions for different types of horticultural crops.

LEARNING OBJECTIVES

Upon completion of the course, students should have an appreciation for the factors related to quality deterioration and wastage of horticultural commodities after harvest. These factors include physiological, biochemical, and pathological considerations, as well as compositional and physical changes occurring during maturation and deterioration. Students will understand commercial procedures for harvesting, preparation, packaging, transportation, and storage of horticultural crops in relation to biological principles and individual commodity requirements and responses. Students should possess the knowledge required to evaluate existing postharvest handling systems and be able to recommend improved practices that will better maintain product quality during the postharvest period.

PREREQUISITES: BOT 3503 and BCH 3023 or equivalent.

COURSE GRADE

1. Midterm 1	100 points
2. Midterm 2	100 points
3. Final Exam	200 points
4. <u>Research project report</u>	<u>100 points</u>
Total	500 points

Exams will be open book with 1 week to complete.

Students will conduct a postharvest research project and create a PowerPoint report for other students to view. Detailed instructions for the research report will be distributed in a separate sheet.

There will be a 5-point reduction for each day late in submitting an exam or the project report.

GRADING SCALE

A (4.0) = 470 - 500 points (94-100%)	C (2.0) = 365 - 384 points (73-76%)
A- (3.67) = 450 - 469 points (90-93%)	C- (1.67) = 350 - 364 points (70-72%)
B+ (3.33) = 435 - 449 points (87-89%)	D+ (1.33) = 335 - 349 points (67-69%)
B (3.0) = 415 - 434 points (83-86%)	D (1.0) = 315 - 334 points (63-66%)
B- (2.67) = 400 - 414 points (80-82%)	D- (0.67) = 300 - 314 points (60-62%)
C+ (2.33) = 385 - 399 points (77-79%)	E (0) = < 300 points (<60%)

Additional information on current UF grading policies for assigning grade points can be found here:

- *Grading policy*, <http://gradcatalog.ufl.edu/content.php?catoid=11&navoid=2486#grades>

COURSE MATERIALS

TEXTBOOK

No textbook is required for the course. However, the following supplemental reading sources may be helpful during this course.

- Postharvest technology of horticultural crops, 3rd edition, 2002, edited by A. A. Kader (Coop. Ext., Univ. of Calif.) "Kader"
- Fruit and Vegetables. Harvesting, Handling and Storage, 3rd edition, 2015, by A.K. Thompson (Wiley) "Fruit & Veg"
- Postharvest: An Introduction to the Physiology and Handling of Fruit and Vegetables, 6th edition, 2016, by R.B.H. Wills et al. (CAB International). "Wills"
- Postharvest Physiology and Biochemistry of Fruits and Vegetables, 1st edition, 2018, edited by E. Yahia and A. Carrillo-Lopez (Elsevier) "PH Phys"
- Postharvest Technology of Perishable Horticultural Commodities, 1st edition, 2019, edited by E. Yahia (Elsevier) "PH Tech"

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:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

- *UF Attendance policy*, www.catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Technical Difficulties

If you are experiencing technical difficulties with Canvas, you should immediately contact the UF Help Desk. This will generate a ticket number, which documents the date and time of your technical difficulty. Any requests to make-up late work due to technical difficulties must be accompanied by this ticket number.

- *UF Help Desk*, HUB 132, (352) - 392 - 4357, www.lss.at.ufl.edu/help.shtml

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

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 Resource Center*, CR-100 Reitz Union, 392-1601, www.crc.ufl.edu/next-level

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. These evaluations are conducted online at:

- *Course evaluations*, www.evaluations.ufl.edu

Evaluations are typically open during the last two or three weeks of the semester. You will be notified of the specific times when evaluations for this course are open. Summary results of these assessments are available to students at:

- *Evaluations summary*, www.evaluations.ufl.edu/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*, www.dso.ufl.edu/documents/UF_Complaints_policy.pdf

COVID Safety

The laboratory portion of this course will involve conducting an individual research project in the Postharvest Laboratories in Fifield Hall. You will work under the direct supervision of Dr. Brecht's Biological Scientist, Mr. Moshe Doron. All of the laboratory space and equipment is to be reserved through Moshe in order to assure that no more than the allowed number of people will be working in any lab at the same time.

Students, instructors and all lab personnel are required to adhere to the following procedures for your safety and the safety of others:

1. Ingress/egress for Fifield Hall is through the main entrance facing Hull Road (south); the doors are unidirectional.
2. Wear a face mask upon entering the building and at all times while in the building, including labs.
3. Maintain physical distance (minimum 6 feet) from other people and use the touchless hand sanitizer stations that are prominently displayed. Use hand sanitizer before and/or after touching door handles.
4. The restrooms in Fifield Hall are single occupancy; nudge the door shut while using the restroom in order to indicate it's occupied and leave the door ajar upon leaving in order to indicate that it's not.
5. The postharvest labs, 1206, 1208, 1214, and 1225, are currently limited to no more than 2 persons working at the same time; 1315 (GC lab) is limited to 1 person. Moshe Doron will tell you and revise schedules if this changes.
6. Wash your hands and use hand sanitizer (available in labs) between lab activities.
7. Alcohol wipes and/or disinfectant sprays are available in all the labs – use them between activities to disinfect the surfaces that you touch, including keyboards and touchpads, to avoid cross-contamination between you and other people

Contingency plans for student or instructor illness:

- If you are sick, don't come to Fifield Hall. Communicate with Dr. Brecht by email about your situation.
- If your symptoms are consistent with COVID-19 infection, seek medical assistance and inform Dr. Brecht so he can alert the other students in case they have been in contact with you in order to self-quarantine.
- If either of the instructors, Dr. Brecht or Dr. Ritenour, or Moshe Dorn, are sick, you will be notified as above by one of the others.

Contingency plan for meeting course objectives if the university has to cancel in-person instruction:

- In the event that in-person activities are cancelled, we will consult with you to develop and conduct an alternate research project that you can conduct without using the postharvest labs.

HOS4332C & HOS5085C
PRINCIPLES OF POSTHARVEST HORTICULTURE
Course Schedule

Lec. #	Instr.	Lecture Topic	Supplemental Reading
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I. BIOLOGICAL CONSIDERATIONS

Wednesday, August 24 - Fall classes begin (Lectures 1 & 2 posted)

1	MAR	Introduction - Postharvest deterioration and losses	PH Tech., Ch. 2
2	JKB	Morphology, structure, growth and development	PH Phys., Ch. 6; and PH Tech., Ch. 3

1/17 Discussion date #1: (Lec. 1-2) **(Incl. Research Project Assignment)**

3	JKB	Composition of horticultural crops	PH Phys., Ch. 2
4	JKB	Compositional changes during maturation & ripening	Wills, Ch. 3

1/24 Discussion date #2: (Lec. 3-4)

5	JKB	Ethylene & other plant hormones - role in senescence	PH Phys., Ch. 5
6	JKB	Ethylene and fruit ripening	PH Phys., Ch. 7

1/31 Discussion date #3: (Lec. 5-6)

7	MAR	Respiration - introduction, measurement	PH Phys., Ch. 4
8	MAR	Respiration - internal and environmental factors	

2/7 - Lab project topics due

2/7 Discussion date #4: (Lec. 7-8)

9	MAR	Transpiration & water loss	PH Phys., Ch. 8; and PH Tech., Ch. 8
10	JKB	Physiological disorders	PH Tech., Ch. 15

2/14 Discussion date #5: (Lec. 9-10)

11	Ritenour	Postharvest pathology - host-parasite interactions	Fruit & Veg, Ch. 8
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12 Brecht Postharv. pathol. - environmental factors & control

MIDTERM EXAM - through physiological disorders (lectures 1-10)

Posting date: 2/14; Due date: 2/21

2/21 Discussion date #6: (Lec. 11-12)

II. COMMERCIAL PRACTICES

13 JKB Maturity and quality standards Fruit & Veg, Ch. 2

14 MAR Food safety & quarantine treatments Fruit & Veg, Ch. 9 & 10

2/28 Discussion date #7: (Lec. 13-14)

3/6 –Lab project progress reports due

15 MAR Harvesting, handling and packinghouse operations PH Tech., Ch. 5 & 9

16 MAR Temp. management - cooling methods & principles PH Tech., Ch. 8

3/6 Discussion date #8: (Lec. 15-16)

3/13 Spring Break – ENJOY!

17 JKB Comm. storage; modified & controlled atmospheres PH Tech., Ch. 12 & 13

18 MAR Transportation & the distribution system PH Tech., Ch. 18; and

3/20 Discussion date #9: (Lec. 17-18) Fruit & Veg., Ch. 10

MIDTERM EXAM – Postharvest pathology through distribution and marketing (lectures 11-18)

Posting date: 3/20; Due date: 3/27

III. COMMODITY REQUIREMENTS

19 MAR Tropical & Subtropical fruits Kader, Ch. 30 & 31

20 MAR Small fruits, Pome & Stone fruits Kader, Ch. 27-29

3/27 Discussion date #10: (Lec. 19-20)

21	JKB	Vegetables – leafy, succulent, & storage organs	Kader, Ch. 34-35
22	JKB	Vegetables – immature & mature fruits	Kader, Ch. 33

4/3 Discussion date #11: (Lec. 21-22)

23	JKB	Fresh-cut vegetables & fruits	Kader, Ch. 36
24	MAR	Cut flowers & potted plants	Kader, Ch. 25

4/10 Discussion date #12: (Lec. 23-24)

4/17 - Project reports due and student presentations (10-min ppt)

4/24 – Last Day of Classes

FINAL EXAM – Cumulative (50%), but focusing on lectures 19–24 (50%)

Posting date: 4/17; Due date: 4/24