HOS 2333 FIGHTING FOOD WASTE AND LOSS
Quest 2

I. Course Information

Meeting Day/Time: T, Period 6-7 (12:50 PM- 1:40, 1:55-2:45 PM); R, Period 6, (12:50 PM – 1:40 PM)
Location: Fifield Hall Room 2316
Primary General Education Designation: Biological Sciences
Secondary General Education Designation (if seeking): International (N)
A minimum grade of C is required for general education

Instructor

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Office location: Fifield Hall Room 1213
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Course Description

Why should we care about Food Waste? In the United States, Americans throw away as much as 40% of all food at an estimated cost of $165 billion every year. Worldwide, one-third of the world's food — some 1.3 billion tons — is lost or wasted every year. The facts of food loss and waste and the resulting consequences affect us in many ways, ranging from important economic and social issues to lasting and detrimental environmental problems. We need to work on these issues to develop a sustainable environment for global food security, population growth, and human health. This class is a biological science general education class designed for all students who are interested in learning and reflecting upon the major future challenges of food and agriculture. Students will learn about postharvest biology, environmental and food sciences, and communication technology in reducing food waste. Through active learning activities, group discussion, and field trips, students will gain knowledge on the interactions and interdisciplinary approaches among horticultural science, animal science, agronomy, environmental biology, food science & human nutrition, and public health as well as develop critical skills in the analysis of food waste problem. We will help students identify the current issues in food waste and loss, evaluate the economic problems of food waste, develop critical thinking, and identify strategies to reducing food waste and loss. The class include guest lectures, TED talks, group discussion and students` oral presentation. Assignments will include group discussions, report writings on selected topics, and oral presentation.

Required & Recommended Course Materials (to purchase/rent)

Required

- ***Postharvest handling,*** Florkowski, 2009. (Textbook, Postharvest Waste and Loss)
- ***Postharvest, an introduction to the physiology and handling of fruit and vegetable,*** Ron Wills and John Golding, 2016. (6th Edition, Textbook)

Recommended Readings

- ***Taking a Bite out of Food Waste: A Closer Look at What We're Leaving on the Table***, Adrian Hertel, 2018. (Empower Stakeholders)
- ***Food Waste at Consumer Level: A Comprehensive Literature Review***, Ludovica Principato, 2018. (Communication Technology in Food Waste and Loss)
- ***Sustainable Food Waste-To-Energy Systems,*** Thomas Trabold and Callie Babbitt, 2018. (Textbook, Sustainable energy)
- ***Postharvest Pathology,*** Don Prusky, 2010. (Textbook, Food Safety)
- ***Postharvest Extension and Capacity Building for the Developing World,*** Majeed Mohammed, Forwarded by Lisa Kitinoja. 2018. (International studies on Food Security)
- ***Characterization and Management of Food Loss and Waste in North America,*** White Paper by CEC (Commission for Environmental Cooperation), 2017. (Case studies on Food Waste)
- ***Food and Agriculture Organization of the United Nations report,*** FAO. 2011. (Food Safety)
- ***100 Under $100: Tools for Reducing Postharvest Losses,*** Betsy Teusch, 2019. (Textbook, Communication Technologies in Reducing Food Waste and Loss)

II. Coursework & Schedule

1. List of Graded Work

Assignment	Description	Requirements	Points
Weekly quizzes	A 10-question quiz will be available in Canvas on Thursday. Quizzes will consist mostly of multiple-choice questions. Each quiz will be worth 4 points, and there will be 10 quizzes during the semester. The objective of this assignment is to understand the concepts of food waste and loss and to recognize the global food wastage footprint.	Each quiz will be timed to 10 minutes, and it can only be taken once. Students must bring a web-enabled device (laptop computer, tablet computer, phone) to take the quiz in class.	**40 points, 40%**
Video recording	The objective of this assignment is to document postharvest fruits or vegetables deterioration and its associated composting to create an informative video about the process of senescence and degradation for a fresh produce. Experience the technologies to reduce food waste and loss through communication with family and local community. Students will work in teams to make two videos. One is to demonstrate the fruit or vegetable decay, the other is to describe the composting process. Students will give 5 min explanation on how fresh produces are deteriorated and what biological events associated with the observations. Video will be peer-evaluated one week before the final exam.	Students will share videos with classmates and make PowerPoint for the case study of composting. Then, based on their case study information and feedback, students will prepare and record a 5-minute video where they introduce postharvest handling, process and storage of their vegetables and fruits as well as strategies for composting to reduce food waste and loss. Additional guidelines and grading rubrics for each submission will be provided via Canvas.	**10 points, 10%**
Mid-Term Exam	The mid-term exam will be given on campus at the 8th class week on the canvas website.	Students must bring a laptop for the exam which will contain 20 questions. Students must bring a web- enabled device (laptop computer, tablet computer, phone)	**10 points each, 10%**

		to take the exam. If there is an issue with attending the exam at this time, it should be discussed with the Dr. Tie Liu at least one week before the exam.	
Final Exam	The final exam will be given on campus at the final week.	Students must bring a laptop for the exam which will contain 20 questions. Students must bring a web- enabled device (laptop computer, tablet computer, phone) to take the exam. If there is an issue with attending the exam at this time, it should be discussed with the Dr. Tie Liu at least one week before the exam.	**10 points each, 10%**
Oral Presentation	Students will prepare and present a 15-minutes oral presentation followed by a five-minute feedback section and discussion. The objective of this assignment is to explore the cultural, economic, political, and/or social systems and beliefs mediate people's understanding of an increasingly connected world.	Additional guidelines and grading rubrics will be provided via Canvas.	**20 points, 20%**
Class discussion	Comments always insightful & constructive; uses appropriate terminology. Comments balanced between general impressions, opinions & specific, thoughtful criticisms, or contributions.	Additional guidelines and grading rubrics will be provided via Canvas. Students should ask two or more questions per week to receive the credits.	**5 points, 5%**
Class participation		Excellent (100% participation, 5 points), good (90% participation, 4 points), average (80% participation, 3points), below average (70% participation, 1 points).	**5 points, 5%**

2. Weekly Course Schedule

Week	Topic Area	Weekly SLO Description	Assignment and Weekly Readings
Food Waste and Loss			
1 **Aug 25** **Thu**	Food Waste and Loss: Why Should We Care? (Part I) (Overview of food loss and waste)	Recognize the global challenge of postharvest loss reduction in South America, Europe, and Asia	***Reducing Food Loss and Waste,*** *2019, WRI Page 3-15* (13 pages) FAO website: http://www.fao.org/food-loss-and-food-waste/flw-data) TED talk: A Recipe for Cutting Food Waste: Peter Lehner:https://www.youtube.com/watch?v=UwOHpWTRsbE
2 **Aug 30** **Tue**	Food Waste and Loss: Why Should We Care? (Part II) Guidelines for preparing oral presentations.		
Sep 1 **Thu**	Field trip: HOS teaching garden		
3 **Sep 6** **Tue**	Increasing Food Security by Optimizing Consumption **Invited Speaker:** Dr. Jeff Brecht, Professor, Department of Horticultural Sciences	Understand postharvest physiology of fruit and vegetable. Explore cultural, historical, sociopolitical and geographical aspects on food waste	***Postharvest*** *Ron Wills: Chapt. 1. Page 1-15 (15 pages)* Poore, J., and T. Nemecek. "Reducing Food's Environmental Impacts through Producers and Consumers." *Science* 360, no. 6392 (June 1, 2018): 987–92. https://doi.org/10.1126/science.aaq0216.
Sep 8 **Thu**	Paper discussion (Dr. Jeff Brecht's recent publication) Quiz1		
4 **Sep 13** **Tue**	Innovative Biological Approaches to Reduce Food Waste and Loss Dr. Jeff Brecht	Learn various postharvest technologies	*Ron Wills, 2007, Chapt. 2, Page 16-33 (16 pages)*

Sep 15 Thu	Guidelines for taking a time-lapse video of a vegetable or fruit. Quiz 2		
5 Sep 20 Tue	Postharvest Procedures for the Maintenance of Food Quality (Vegetables and Fruits)	Postharvest technology to reduce food waste and loss	***Postharvest*** *Ron Wills, 2007, Chapt. 3, Page 34-60 (25 pages)* Ma, Yingqun, and Yu Liu. (2019) "Turning Food Waste to Energy and Resources towards a Great Environmental and Economic Sustainability: An Innovative Integrated Biological Approach." *Biotechnology Advances* 37, 7 https://doi.org/10.1016/j.biotechadv.2019.06.013.
	Postharvest Procedures for the Maintenance of Food Quality (Meat and Dairy)		
Sep 22 Thu	Paper discussion (Dr. Jeff Brecht's recent publication) Guidelines for watching TED talks and taking Field Trips. Quiz 3		
6 Sep 27 Tue	Reduce Food Waste on Livestock Products	Identify the best practices to keep meat fresh	***Postharvest handling,*** *Florkowski, 2009* *Chapt. 4, Page 43-52 (10 pages)* FReSH-FLW_Value_Calculator_beta-v1.1.xlsm FReSH_FLW-value-calculator_HOW-TO-USE.pdf https://www.thefoodwasteatlas.org/home (Links to an external site.) FLW_Protocol_Guidance_on_FLW_Quantification_Methods.pdf FLW_Standard_Exec_Summary.pdf
	Case studies: Grocery Meat and Food Terminal Rescue Programs-Moisson Montreal	Analyze and interpret the various cultural, historical, sociopolitical and geographical factors that affect food waste	
Sep 29 Thu	Food Waste and Loss Calculator study Quiz 4		
7 Oct 4 Tue	Impossible Burger: Future of Meat and Its Impact to Reduce Food Waste	Identify nutrition loss and alternative food for meat	***100 Under $100****,* Betsy Teusch. *Section 5 Page200-212 (12 pages)* Video: TED talk: Compost king: Paul Sellew (Before Wednesday's class)

	The Plant-based Alternatives to Meat Group discussion on TED talk: Compost king: Paul Sellew https://www.youtube.com/watch?v=6eXRfynD-M8		Nature- reduce meat cosumption.pdf Video: TED talk https://www.ted.com/talks/bruce_friedrich_the_next_global_agricultural_revolution?utm_campaign=tedspread&utm_medium=referral&utm_source=tedcomshare
Oct 6 Thu	Student presentation 1. Quiz 5		
Sustainable Food Waste-to-Energy Systems			
8 **Oct 11 Tue**	Mitigate Food Loss and Waste and Cultivate for More Sustainable Food Systems **Invited Speaker:** Ziynet Boz Assistant Professor, ABE Department	Explore small scale postharvest handling technology. Relate the food waste in the local community.	***100 Under $100,*** *Betsy Teusch.* *Section1, Page15-60 (34 pages)* *Video:* TED talk: Stop Wasting Food: Selina Juul (15 min) https://www.youtube.com/watch?v=dIIhbjY4s8A
	Urban Farming and Future Agriculture Paper discussion		
Oct 13 Thu	Student presentation2. Quiz 6		
9 **Oct 18 Tue**	Feeding Food with Food (Food Waste Composting) **Invited Speaker:** Dr. Xin Zhao	Identify small scale postharvest handling Technology. Relate the food waste in the local community.	***Sustainable Food Waste-To-Energy Systems,*** Thomas Trabold and Callie Babbitt, 2018. Slorach, Peter C. et al. "Assessing the Economic and Environmental Sustainability of Household Food Waste Management in the UK: Current Situation and Future Scenarios." *Science of The Total Environment* 710 (March 2020): 135580. https://doi.org/10.1016/j.scitotenv.2019.135580
Oct 20	**Sustainable Waste-to-energy System: Alternative/Advance Technologies**	Technologies in converting	

Thu		waste to energy systems	***Sustainable Food Waste-To-Energy Systems,*** Thomas Trabold and Callie Babbitt, 2018. *Page 238-250 (12 pages)* TED talk: The Global Waste Scandal; (15 min) https://www.ted.com/talks/tristram_stuart_the_global_food_waste_scandal?language=en#t-268769
	Paper discussion (Dr. Xin Zhao`s recent publication) Group Discussion		
10 **Oct 25** **Tue**	Sustainable Waste-to-energy System: Conventional Methods		
Oct 27 **Thu**	Student presentation 3**, Quiz 7** **Mid-term Exam (30 min)**		
Food Safety			
11 **Nov 1** **Tue**	Keeping Food Fresh (Postharvest Pathology) **Invited Speaker:** Dr. Mark Ritenour, Professor, Horticultural Sciences Department	Identify the postharvest diseases	***Postharvest Pathology,*** *Don Prusky.* *Chapt.1, Page 1-12 (12 pages)*
	Keeping Food Fresh (Postharvest Pathology) Dr. Mark Ritenour, Professor		
Nov 3 **Thu**	Paper discussion (Dr. Mark Ritenour`s recent publication) Student presentation 4. Quiz 8		
12 **Nov 8** **Tue**	Food traceability and recall (The rise of recalls)	Recognize microbiology in food processing	Food Recall: https://edis.ifas.ufl.edu/fs108
Nov 10 **Thu**	Field Trip: The Postharvest Lab, Fifield Hall 1208 Paper discussion Student presentation 5.		

	Quiz 9		
13 **Nov 15** **Tue**	Harnessing predictive food microbiology to reduce food waste (Part I) **Invited Speaker:** Dr.Daniel Czyz, Assistant Professor of Microbiology & Cell Science(http://microcell.ufl.edu/people/faculty-directory/czyz/)	Explore technologies in reducing food contamination	Antibiotic Resistance Threats in the United States 2019-ar-threats-report-508.pdf Lecture 21 - Food and human gut as reservoirs of transferable antibiotic resistance encoding genes.pdf Lecture 2 - Reducing antimicrobial use in food animals.pdf
	Harnessing predictive food microbiology to reduce food waste (Part II), Quiz 10 **Invited Speaker:** Dr.Daniel Czyz		
Nov 17 **Thu**	Field Trip: The Field and Food Pantry, UF campus		
Communication Technology in Reducing Food Waste and Loss			
14 **Nov 22** **Tue**	Effects of Waste on the Public Wallet **Invited Speaker:** Field & Fork Program, (https://fieldandfork.ufl.edu/about/our-team/)	Identify economic impact of food waste and loss. Explore the connections between food waste and culture, and food and science.	***100 Under $100,*** *Betsy Teusch.* *Section 4, Page 152-197 (45 pages)*
Nov 24 **Thu**	Holiday		
15 **Nov 29**	Food Waste and Hunger in Africa	Learn food loss and waste in	

Tue	Steve Sargent, Professor, Horticultural Science Department	Africa and other developing countries	***Postharvest Extension and Capacity Building for the Developing World,*** Majeed Mohammed, Forwared by Lisa Kitinoja. 2018. Feed the Future Tanzania Mboga na Matunda (FTFT-MnM) Tanzania MnM Monthly Update_March 2020.pdf Video: Wasted! The Story of Food Waste (2017) *Anthony Bourdain* https://www.imdb.com/video/vi1612232985?
	Student presentation 6		
Dec 1 Thu	What Can We Do About Food Waste and Loss? **Invited Speaker:** Dr.Kevin Folta, Professor, Horticultural Science Department	Communication and outreach strategies in reducing food waste in various countries and regions	***Reducing Food Loss and Waste,*** *2019, WRI Chapt.1, Page 17-21(5 pages)* The power of suboptimal food choice and how we communicate issues in quality and edibility https://medium.com/working-for-change/my-rescue-bananas-6fc6f819bf7c
16 Dec 6 Tue	ReFED: the 27 Solutions to Reduce Food Waste and Loss Integrated solution to reduce food waste and loss	Summary of solutions to reduce food waste and loss	
Dec 8 Thu	Student presentation 7		
17 Dec 13 Tue	Final exam (20 min)		

III. Grading

3. Statement on Attendance and Participation

Attendance and Participation:

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/UGRD/academic-regulations/attendance-policies/

- Participation: Consistent informed, thoughtful, and considerate class participation is expected and will be evaluated using the rubric below. The instructor will inform you of your participation grade to date when mid-term exams are returned and schedule a conference if you are earning below 70% of the possible points.
- NOTE: If you have personal issues that prohibit you from joining freely in class discussion, e.g., shyness, language barriers, etc., see the instructor as soon as possible to discuss alternative modes of participation.

Participation Grading Rubric (**5 points, 5%**):

	High Quality	**Average**	**Needs Improvement**
Informed: Shows evidence of having done the assigned work.	9-10	6-8	1-5
Thoughtful: Shows evidence of having understood and considered issues raised.	9-10	6-8	1-5
Considerate: Takes the perspective others into account.	9-10	6-8	1-5

4. Grading Scale

For information on how UF assigns grade points, visit: https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

A	95 – 100% of possible points		C	74 – 76%
A-	90 – 94%		C-	70 – 73%
B+	87 – 89%		D+	67 – 69%
B	84 – 86%		D	64 – 66%
B-	80 – 83%		D-	60 – 63%
C+	77 – 79%		E	<60

IV. Quest Learning Experiences

5. Details of Experiential Learning Component

- The experiential learning component will be achieved through the examination of postharvest issues, energy-to-waste system, food safety and education to find solutions to reduce food waste and loss. Each week, students will study lecture concepts on the topics of the four core areas. During the class on Wednesday, the case studies and discussion on the topics will be brought by practicing critical thinking. An oral presentation on Friday will be summarized the research-based articles for evidence of application activities in the four core areas and reinforced critical evaluation for discussion.

6. Details of Self-Reflection Component

- In weekly class lectures, students will be required to participate in group discussion about the TED talks on Reducing Food Waste and Loss. A video recording assignment on Food Composting was designed to give students opportunity to learn and practice food recovery system at home and local community. Students will present their videos to the class and participate peer evaluation. Students were also required to submit the final written assignment to discuss global food security and present their ideas and hypotheses on developing potential strategies to reduce food waste and loss to maintain food quality for environmentally sustainable methods.

V. General Education and Quest Objectives & SLOs

7. This Course's Objectives—Gen Ed Primary Area and Quest

Quest 2 courses are grounded in the modes of inquiry and analysis characteristic of the social and/or biophysical sciences, Quest 2 courses invite students to address pressing questions facing human society and the planet—questions that outstrip the boundaries of any one discipline and that represent the kind of open-ended, complex issues they will face as critical, creative, and thoughtful adults navigating a complex and interconnected world.

General Education, Biological Sciences (B) Description:

Biological science courses provide instruction in the basic concepts, theories and terms of the scientific method in the context of the life sciences. Courses focus on major scientific developments and their impacts on society, science and the environment, and the relevant processes that govern biological systems. Students will formulate empirically testable hypotheses derived from the study of living things, apply logical reasoning skills through scientific criticism and argument, and apply techniques of discovery and critical thinking to evaluate outcomes of experiments.

Accomplishing Objectives:

After taking Fighting Food Waste and Loss course, students will be able to:

1. Explain the global issue of food loss and waste.
2. Analyze current food loss and waste issues and the relationships among food safety, nutrition and public health as well as the related environmental, social, and economic impacts.
3. Summarize and evaluate research-based articles for evidence of anthropogenic activities altering biodiversity and, subsequently, ecosystem services.

8. This Course's Student Learning Outcomes (SLOs)—Gen Ed Primary Area and Quest

Quest 2 Student Learning Outcomes:

1. Identify, describe, and explain the cross-disciplinary dimensions of a pressing societal issue or challenge as represented by the social sciences and/or biophysical sciences incorporated into the course. (**Content**)
2. Critically analyze quantitative or qualitative data appropriate for informing an approach, policy, or praxis that addresses some dimension of an important societal issue or challenge. (**Critical Thinking**)
3. Develop and present, in terms accessible to an educated public, clear and effective responses to proposed approaches, policies, or practices that address important societal issues or challenges (**Communication**)
4. Connect course content with critical reflection on their intellectual, personal, and professional development at UF and beyond. (**Connection**)

General Education, Biological Sciences Student Learning Outcomes:

1. Identify, describe, and explain the basic concepts, theories and terminology of natural science and the scientific method; the major scientific discoveries and the impacts on society and the environment; and the relevant processes that govern biological and physical systems. (**Content**)
2. Formulate empirically testable hypotheses derived from the study of physical processes or living things; apply logical reasoning skills effectively through scientific criticism and argument; and apply techniques of discovery and critical thinking effectively to solve scientific problems and to evaluate outcomes. (**Critical thinking**)
3. Communicate scientific knowledge, thoughts, and reasoning clearly and effectively. (**Communication**)

Accomplishing Objectives:

After taking Fighting Food Waste and Loss, students will be able to:

1. Evaluate the environmental and economic impacts of food waste and food loss. Discuss global food security.
2. Develop potential strategies to reduce food waste and loss to maintain food quality and to develop environmentally sustainable methods.
3. Identify and communicate the strategies to reducing food loss and waste to create a sustainable food future.

9. Secondary Objectives and SLOs

General Education, International (I) Description:

International courses promote the development of students' global and intercultural awareness. Students examine the cultural, economic, geographic, historical, political, and/or social experiences and processes that characterize the contemporary world, and thereby comprehend the trends, challenges, and opportunities that affect communities around the world. Students analyze and reflect on the ways in which cultural, economic, political, and/or social systems and beliefs mediate their own and other people's understanding of an increasingly connected world.

General Education, International Student Learning Outcomes:

1. The general education objects will be accomplished through the identification of the global issue of food waste and loss in the aspects of the environment, economy, food safety, and ethics to discuss the potential solutions to reduce the food waste and to develop a sustainable agriculture globally. (**Content**)
2. Students will understand the food waste and loss has become a worldwide topic of interests and study the postharvest biology and technology to reduce food waste and loss. (**Critical thinking**)
3. Each week, a lecture and a TED talk followed by a discussion will be provided to discuss the topics from worldwide problem to household solutions of reducing food waste and loss. Students will make assessment and discuss the potential solution through critical thinking and group discussions. (**Communication**)

VI. Required Policies

10. Students Requiring Accommodation

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

11. UF Evaluations Process

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/. 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/.

12. University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students 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." The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

13. Counseling and Wellness Center

Contact information for the Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc/Default.aspx, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

14. The Writing Studio

The writing studio is committed to helping University of Florida students meet their academic and professional goals by becoming better writers. Visit the writing studio online at http://writing.ufl.edu/writing-studio/ or in 2215 Turlington Hall for one-on-one consultations and workshops.