

Principles of Food Processing

Advanced Food Processing

FOS4427C or FOS6936

Lecture: M,W,F Period 3 (9:35 am – 10:25 am); Lab: F Periods 6-8 (12:50 pm – 3:50 pm)

Location: Lecture, Weimer Hall 1084; Lab, FSHN Pilot Plant

Syllabus

Instructors:

Maurice R. Marshall

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352-294-3981

Rm 1, Food & Environmental Toxicology Lab
(corner of Hull and Mowry Rds and SW 23rd Dr –
across from Campus Edge Condos)

Office Hours: Open Door Policy –Recommend
call or email first before you come because of
the distance.

Ziyne Boz

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Office Hours:

Lab Coordinator:

Xixuan Tang

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Office Hours:

Course Assistants

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Office Hours:

Course Description:

Prerequisites: AOM4062 or FOS4222 or FOS4311

Principles of processing foods: cooling, freezing, heating, dehydrating, concentrating, irradiating, fermenting and the use of chemicals. The course will involve the student with the food processing principles mentioned above. Laboratory exercises will provide hands on experiences of these principles.

Course Objectives:

Students will build on the fundamentals of food science through being exposed to the principles of food processing. Fundamental principles of processing operations will be discussed such as units, mass balance, mixing, sizing, separation, blanching, pasteurization, freezing, as well as new emerging technologies. Laboratories will provide hands-on-experience with these processing operations explored in class and through field trips to various food processing facilities.

Specific objectives:

1. To define each food processing operation by identifying equipment and comparing and contrasting the equipment used for each process.
2. To describe the theory of each process.
3. To identify mathematical equations and calculate their parameters that assist in explaining these processing operations.

4. To design and provide a report as a group project on a processing operation for a selected food. A graduate student will be the team manager for this project.
5. Graduate Students: To develop a report and lecture to present to the class on a new emerging food processing technology.

Required Text:

PJ Fellows, Food Processing Technology: Principles and Practice, 4th edition, Woodhead Publishing, 2017. <http://search.ebscohost.com/login.aspx?direct=true&AuthType=ip,uid&db=nlebk&AN=1214608&site=ehost-live>

Learning Activities:

Classroom lecture – PowerPoint with selected videos; Assignments or practice problems; Guest lectures by Graduate students on emerging food processes (Graduate Assignment)²; Field trips; Laboratory exercises or demonstrations, Group design project¹.

¹Design project: students will divide into groups with a graduate student as team leader. The groups will design a processing scheme for an assigned product from raw material handling to final product including packaging for distribution. The group will be required to submit a report (shoot for 8-10 pages plus references) and present to the class a 10 min PowerPoint presentation by the team leader (graduate student). For the project the group should pick equipment needed for each phase of production. They should discuss the pro and cons of the equipment selected and justify its use in the process. **Note:** All group members must participate in preparing the report and the presentation. The team leader and group members should not allow a member to sign the report and be named in the presentation if they have not contributed to the project. Assessment: All members, 75 pts - report; 25 pts - presentation; Graduate student, 10 pts - presentation; 10 pts - evaluation by team members, total 20 pts.

²Graduate project: you will select for approval a new emerging food process. You will be required to submit a brief report (maximum 5 pages plus references) (30 pts) on the process and then develop a PowerPoint lecture (20 min) (60 pts) to present to the class. You will be required to have the presentation available to the class 2 days before your lecture date. Also, you will submit to the instructor 2 exam questions (10 pts) from your presentation for Exam 3. **Note:** you must include at least 3 scientifically peer reviewed articles on the process you selected.

Assessment Tools:

Written exams, assignments, laboratory reports and performance on projects will be used to assess students’ learning outcomes. In addition, observations during classroom and discussions on field trips will also be evaluated.

Course Schedule:

Week	Topic ¹	Book	Instructor
1	Course Introduction	-	Marshall
2	Laboratory 1: Introduction, Safety, Forms Basic Principles: Units, Conversion, Mass Balance	Part I	Boz
3	Laboratory 2: No Lab Basic Principles, Ambient Temp Processing	Part I & II	Marshall
4	Laboratory 3: Basic Principles, Ambient Temp Processing	Part I & II	Marshall
5	Laboratory 4: Basic Principles, Ambient Temp Processing	Part I & II	Marshall
6	Laboratory 5: Thermal Processing	Part III	Boz

	Laboratory 6:		
	Exam 1, Monday February 6, 2017		
7	Thermal Processing	Part III	Boz
	Laboratory 7:		
8	Thermal Processing	Part III	Boz
	Laboratory 8:		
9	Thermal Processing, Freeze Processing	Part III & IV	Boz
	Laboratory 9:		
SPRING BREAK			
10	Freeze Processing	Part IV	Boz
	Laboratory 10:		
11	Freeze Processing, Ohmic, Dielectric and Infrared Heating	Part IV & Part III,	Boz, Marshall
	Laboratory 11:	Chap 19	
	Exam 2, Monday March 20, 2017		
12	Ohmic, Dielectric and Infrared Heating	Part III,	Marshall
	Laboratory 12:	Chap 19	
13	High Pressure and Packaging	Part II, Chap 7	Boz
	Laboratory 13:		
14	Student Projects, Graduate Lectures		Marshall, Boz
	Laboratory 14:		
15	Graduate Lectures		Marshall, Boz
	Exam 3, Wednesday April 19, 2017		

¹Specific topics will be provided on Google calendar.

Grading:

Assessments	Points		Percent of Grade
	Undergrad	Graduate	
Exams (3 @ 100 pts)	300	300	38/33 ³
Assignments (5 @ 20 pts)	100	100	12/11
Laboratories, Field Trips & Reports	300	300	38/33
¹ Class Group Project	100	120	12/12
² Graduate Project	---	100	11
TOTAL	800	920	100/100

³38 (percentage undergraduate)/33 (percentage graduate)

Grading Scale:

Grade	Percent	Minimum Course points	Grade points
A	100 to 91	728/837 ¹	4.00
A-	90 to 88	704/809	3.67
B+	87 to 85	680/782	3.33

B	84 to 81	648/745	3.00
B-	80 to 78	624/717	2.67
C+	77 to 75	600/690	2.33
C	74 to 71	568/653	2.00
C-	70 to 68	544/625	1.67
D+	67 to 65	520/598	1.33
D	64 to 61	488/561	1.00
D-	60 to 58	468/533	0.67
E	Below 58	Below 468/533	0.00

¹728 (minimum pts for grade, undergraduate)/837 (minimum pts for grade, graduate)

Material and Supply Fees:

There is an additional fee for the laboratory which is found in the "Schedule of Courses"

Classroom Policies:

"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>."

Attendance is **required** and students are expected to participate in all laboratories, field trips, group reports and group projects. Students are expected to be on time for lectures and lab. Cellular phones and pagers are disruptive and must be turned off in the classroom and laboratory. Students are expected to be prepared for lecture and laboratories by reviewing the handouts.

Academic Dishonesty:

"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 (<http://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."

Student Accommodations:

"Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc/>) 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."

Student Evaluations:

"Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at

[https://evaluations.ufl.edu/results/.](https://evaluations.ufl.edu/results/)"

University of Florida Counseling Services:

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources.

Health and Wellness

U Matter, We Care:

If you or a friend is in distress, please contact umatter@ufl.edu or 352 392- 1575 so that a team member can reach out to the student.

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.

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department, 392-1111 (or 9-1-1 for emergencies). <http://www.police.ufl.edu/>

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. <https://lss.at.ufl.edu/help.shtml>.

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling. <http://www.crc.ufl.edu/>

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <http://teachingcenter.ufl.edu/>

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers. <http://writing.ufl.edu/writing-studio/>

Student Complaints Campus: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf

On-Line Students Complaints: <http://www.distance.ufl.edu/student-complaint-process/>

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.