

**FOS 6455C**  
**Industrial Food Fermentations**  
**3 Credits, Fall 2020**  
**Proposed Course Syllabus**

**Course Instructors and Office Hours**

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**XXX**

FSHN MS student and lab/demo TA

Xxx building

Email:

Dr. Goodrich Schneider will be responsible for overall coordination and administration of the course, as well as instructional duties. She will be assisted by Ms. Xxx in the preparation/logistics of labs and demos for this course. Additionally, the specialized expertise of the members of FSHN and other faculty will be utilized in the form of guest lectures, laboratory exercises and/or discussions; see syllabus for tentative dates/topics.

**Time/Location:**

- M W F: Period 3 (9:35am – 10:25am) **Lectures will be delivered by Zoom during this scheduled time period. A class link will be provided for registered student use only.** While the registrar has assigned a UF classroom for this time period (Pugh 170), we do not expect to use it. For weeks with no lab/demo/exercise noted, we'll generally have three lectures for the week during period 3, and you'll have period 4 free.
  
- M: Period 4 (10:40am – 11:30am) Location Varies. The FSN 130 (FSHN Pilot Plant), 3<sup>rd</sup> floor Conference Room and the 3<sup>rd</sup> floor Teaching Lab will be utilized as outlined in the instructor's weekly email sent out on the Friday/Saturday preceding the week in question. **We will NOT be utilizing the UF assigned classroom (MCCC 0100) for period 4 except for the 3 scheduled exams.** The laboratory aspect of this class will be a combination of hand-on experiments, demonstrations, and sensory sessions, modified for the COVID-19 related situation of Fall 2020. There will generally be NO lab exercise if a lecture is scheduled for Monday period 3 per the syllabus. Due to the nature of

fermentation and fermented products, there will be occasional events that will not fit into the official time/locations noted. Every effort will be made to accommodate individual schedules and needs. We will follow all UF rules and regulations pertaining to COVID-19.

### **Course Objectives**

The overall objective of the course is to provide graduate-level knowledge, theory and practice for a variety of commercially-important fermented food products and ingredients, from a technical perspective. There will be an interdisciplinary emphasis on safety, regulatory, nutritional, microbiological and economic considerations of processes which add value to and/or reduce waste from agricultural commodities and natural resources.

### **Prerequisites**

The prerequisite course is FOS 4222 or an equivalent course in food microbiology, or permission of instructor. All students must be 21 years of age or older by October 1, 2020 as we will be examining alcohol-containing products in the latter part of the course.

### **Course Format**

Students will acquire knowledge of the microbiological, chemical and physical aspects of food industry fermentations using various learning modalities including remote lectures, discussions, laboratory exercises/demonstrations and assignments. **This course has been identified as having a physical presence component which will be fulfilled through a carefully designed set of exercises that balance interactive learning and learning assessment with the realities of UF's Fall 2020 COVID-19 policies. See course outline for specific class sessions that support this requirement.**

### **Course COVID-19 Policies**

The following rules/procedures will be followed in this course, subject to official UF updates throughout the semester:

- Masks or face coverings will be used by all students and instructors while in UF classrooms (i.e., for exams) or in department-controlled spaces (e.g., the Pilot Plant or conference rooms)
- Physical distancing for exams will be accomplished by taking assigned seats, and filling the room in an orderly manner while maintaining appropriate distances from other students/instructors during ingress/egress (6 ft at this time)
- In labs/demos where experimental food products are consumed, a schedule for students will be provided such that no more than 4 students are present at any time to minimize unmasked exposure time. Masks/face covering will be worn except during actual sensory evaluation.

- As always, any student may opt-out of tasting any product at any time, although other sensory evaluations (appearance, aroma, texture) will be expected.
- A student choosing to not come to campus will be provided with a make-up/alternative assignment; this will be treated as an excused absence.
- Please feel free at any time to address any concerns with the instructor, or with department chair or your major advisor. The goal, in both this course AND your entire Fall 2020 program is to ensure the safety of students, staff and faculty while providing meaningful learning experiences.

### **Textbook and References**

The recommended text, containing the basis for the course material, will be available at the UF Bookstores. It will also be on reserve (electronically) at the Marston Science Library under FOS 6455C and will be made available for 2-hr use, along with other additional resources, in Room 349, FSHN Building. Although I've designated the book as "recommended", that does not mean that it must be purchased, just that the specified chapters will be part of the material for the exam, along with lecture notes and other designated materials. The book is a newly updated version of the text used previously in this course.

An updated syllabus, lectures and supplemental material will be posted on the UF eLearning site: <https://lss.at.ufl.edu/>. We will be utilizing the Canvas platform primarily as an archive of class lectures, supplemental material and exercises.

### **Recommended Text:**

Hutkins, R. 2019. Microbiology and Technology of Fermented Foods, 2<sup>nd</sup> Edition. Wiley Blackwell, Hoboken, NJ, USA.

Link to UF Smathers Library use by UF-associated users:

<https://ebookcentral.proquest.com/lib/ufl/reader.action?docID=5509381>

### **Additional Text Resources (available in FSHN Room 349 for review):**

Hui, Y.H. et al. 2004. Handbook of Food and Beverage Fermentation Technology. Marcel Dekker, Inc., New York, NY.

### **Grading**

- Exams (3) 60%

*These exams will each cover approximately 1/3 of the course lecture material and be equally weighted for each quarter. Exam format will be closed book, 50 minute in-person events with appropriate PPE and physical distancing in MCCC 0100.*

- Assignments/Lab Exercises 40%

*Assignments/exercises represent a significant part of the course grade, and their completion supports learning in the area of food fermentations. One of these assignments will be a term paper, in the form of a scientific review paper on a particular topic relevant to commercial fermented foods, beverages or food ingredients, along with a 20-minute presentation on the same topic, delivered by Zoom to the class. Please adhere to stated deadlines for maximum credit.*

#### **Course Average Grade Equivalents:**

90 - 100 A

88 - 89 B+

80 - 87 B

78 - 79 C+

70 - 77 C

68 - 69 D+

60 - 67 D

This course will not be graded on a curve, and will not utilize minus grades. Please see <http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html> for official University of Florida grading policies.

#### **Working Course Outline**

##### **Week 1**

8/31/20: **Review** of syllabus and course objectives; **Lecture:** Introduction to Food Fermentation (Hutkins Chap. 1)

9/2/20: **Lecture:** Review of fermentation microbiology (Hutkins, Chap. 2), Dr. Schneider ([keiths29@ufl.edu](mailto:keiths29@ufl.edu))

9/4/20: **Lecture:** Starter cultures (Hutkins, Chap. 4), Dr. Schneider

##### **Week 2**

9/7/20: **UF Holiday** – no class (Labor Day)

9/9/20: **Lecture:** Fermentation biochemistry and physiology (Hutkins, Chap. 3); Begin Assignment 1 (Biochemical Pathways)

9/11/20: **Lecture:** Fermented soy products (Hutkins, Chap. 14)

### Week 3

- 9/14/20: **Lecture:** Fermented soy products (con't.)  
9/16/20: **Lecture:** Fermented vegetable products – an overview (Hutkins, Chap. 8);  
Assignment 1 due  
9/18/20: **Lecture:** Fermented vegetables (con't.)

### Week 4

- 9/21/20: **Lab/Demo:** Pick up kimchi materials to make at home; evaluate  
commercially fermented soy and vegetable products; Begin Assignment 2  
(Vegetable Fermentations)  
9/23/20: **Lecture:** Cereal fermentations – yeast-leavened products, sour dough  
bread (Hutkins, Chap. 9)  
9/25/20: **Lecture:** Cereal fermentations with a focus on international products

### Week 5

- 9/28/20: **Lecture:** Vinegar production and *Acetobacter* (Hutkins, Chap. 12)  
9/30/20: Assignment 2 due; **Exam 1** (50 minutes, closed book) in MCCC 0100 at  
10:40am (period 4), following UF COVID-19 related rules  
10/2/20: **UF Holiday** – no class (UF Homecoming)

### Week 6

- 10/5/20: **Lecture:** Fermented fish products (Hutkins, Chap. 14)  
10/7/20: **Lecture:** Fermented meat products (Hutkins, Chap. 7)  
10/9/20: **Lecture:** Fermented meat products/safety (con't.); Begin Assignment 3  
(term paper)

### Week 7

- 10/12/20: **Lecture:** Probiotics and their use in commercial food products; Turn in  
paper topic for approval (Assignment 3)  
10/14/20: **Lecture:** Milk and dairy product chemistry and processing; Introduction  
to dairy fermentations – cultured products (Hutkins, Chap. 5)  
10/16/20: **Lecture:** Cultured dairy products - yogurt/kefir/crème fraiche; Begin  
Assignment 4

### Week 8

- 10/19/20: **Demo:** Cultured dairy product demo/sampling (Assignment 4 con't.)  
10/21/20: **Lecture:** Cheese – Overview and Principles (Hutkins, Chap. 6)  
10/23/20: **Lecture:** Types of cheese – technology and microbes

### Week 9

- 10/26/20: **Lab/Demo:** Cheese evaluation (Assignment 5, but no formal report will  
be due); Assignment 4 due  
10/28/20: **Lecture:** Dairy fermentations wrap-up; Exam 2 review

10/30/20: **Exam 2** (50 minutes, closed book) in MCCC 0100 at 10:40am (period 4), following UF COVID-19 related rules; Assignment 5 due

### **Week 10**

11/2/20: **Lecture:** Wine and wine making (Hutkins, Chap. 11), Dr. Sims ([csims@ufl.edu](mailto:csims@ufl.edu)); Begin Assignment 6

11/4/20: **Lecture:** Wine (con't.), Dr. Sims

11/6/20: **Lecture:** Coffee, cocoa and tea “fermentation” (Hutkins, Chap. 15);  
**Demo/tasting (tentative):** Wine sensory analysis basics (no report due; time/place TBD)

### **Week 11**

11/9/20: **Lecture:** Current trends in fermented food products; Assignment 6 due

11/11/20: No class – UF Holiday

11/20/20: **Lecture:** Sustainability and microbial biomass as food

### **Week 12**

11/16/20: **Lecture:** Beer production (Hutkins, Chap. 9), Dr. MacIntosh ([andrewmacintosh@ufl.edu](mailto:andrewmacintosh@ufl.edu)); begin Assignment 7

11/18/20: **Lecture:** Beer/brewing (con't.), Dr. MacIntosh

11/20/20: **Lecture:** Mead, cider and distilled beverage overview (Hutkins, Chap. 13); submit draft of final paper (Assignment 3) for instructor review and comment (please submit electronically to [goodrich@ufl.edu](mailto:goodrich@ufl.edu))

### **Week 13**

11/23/20: **Exam 3** (50 minutes, closed book) in MCCC 0100 at 10:40am (period 4), following UF COVID-19 related rules

11/25/20: **No class** – Thanksgiving Holiday

11/27/20: **No class** – Thanksgiving Holiday

### **Week 14**

11/30/20: Term paper presentations (Assignment 3a): 2 speakers TBD

12/2/20: Term paper presentations (Assignment 3a): 2 speakers TBD

12/4/20: Term paper presentations (Assignment 3a): 2 speakers TBD

### **Week 15**

12/7/20: Term paper presentations (Assignment 3a): 2 speakers TBD

12/9/20: Term paper presentations (Assignment 3a): speakers TBD; Last day of class

12/11/20: **UF Reading Day** (no class; no work due)

### **Week 16**

12/16/20: Assignment 3b due (Final version term paper); End of course, thank you!

## **Information for All Students**

### **Age restrictions:**

Due to the nature of the products produced and evaluated in this course, all students must be 21 years of age or older by 10/1/18. Registration in this course serves as pledge by student that they meet this requirement.

### **Academic Honesty:**

In the process of enrolling and registering for classes at the University of Florida, every student has signed and presumably understands the following statement:

*"I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University."*

The following information is implicit in all exams and assignments:

*"On my honor, I have neither given nor received unauthorized aid on this exam/assignment."*

### **Use of Library, Personal References, PC Programs, and Electronic Data Bases:**

These items are university property and should be utilized with other users in mind. Never remove, mark, modify nor deface resources that do not belong to you. If you're in the habit of underlining text, do it only on your personal copy. It is inconsiderate, costly to others, and dishonest to use common references otherwise.

### **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.

*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*

### **Disability Issues:**

Students requesting classroom accommodation should register with the Dean of Students Office, who will then provide necessary documentation to the student. Please provide this documentation to the Instructor when requesting accommodation.

### **UF Counseling Services:**

I hope to establish an effective and professional class relationship and encourage dialog so that students feel comfortable discussing academic problems directly with me. In addition, resources are available on-campus for students having personal problems or

lacking clear career and academic goals that interfere with their academic performance. These resources include:

1. University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling;
2. Student Mental Health, Student Health Care Center, 392-1171, personal counseling;
3. Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161, sexual counseling; and
4. Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.