

## FOS 4318/6317C - FLAVOR CHEMISTRY

Credits: 3

Offered Fall Semester of even years.

Class Meeting Times:

Monday Period 6 - McCarty B G108

Wednesday Periods 6 & 7 – McCarty B 2102

### **Instructor:**

Paul J. Sarnoski

Food Science and Human Nutrition Building (Rm 349)

Phone: 352-294-3732

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### **Office Hours**

Wednesdays 3-4:30pm

### **Course Description**

Students taking this class will learn how flavor chemicals impact sensory perception of food. We will also discuss flavor compounds used in foods, their production, isolation, analysis, and specific attributes.

### **Learning Objectives**

LO 1. Differentiate different classes of flavor compounds, their flavors, sources and interactions in foods.

LO 2. Classify different methods of flavor trapping, isolation and application.

LO 3. Communicate different methods of analysis for identification of flavor compounds and compare their applications, advantages and disadvantages.

### **Course Prerequisites**

General Chemistry: CHM 2045, CHM 2046 sequence (with labs): Need to meet a minimum C requirement for the courses specified or equivalent courses.

Organic Chemistry: CHM 2200 or CHM 2210, CHM 2211 sequence (with labs): Need to meet a minimum C requirement for the courses specified or equivalent courses.

FOS 4311 (Food Chemistry) and FOS 4321C (Food Analysis) are strongly recommended but not required

### **Course Outcomes**

Students will be able to identify the role of flavor molecules in food, from both a sensory and food quality perspective. This will involve being able to identify the chemical structures of flavor compounds, and how those chemicals are produced from a synthetic or biological perspective. Themes will include the use of analytical chemistry to identify flavor compounds. Impacts of processing, packaging, and storage on flavor quality and stability will be covered.

## Grading Scheme

Exams (2) - 100 pts each

Homework/Reports/Participation - 200 pts

Final Project - 150 pts – (Grad Students only)

Final Exam – Cumulative Take Home Exam – 100 pts

**Total:** 650 pts (Graduate); 500 (Undergraduate)

*Reports are usually due 7 days after conducting the experiment. Four homeworks and four in-class experiments will be conducted over the course of the semester. The homeworks consist of problem solving related to topics covered in class. Reports should include a description of the experiment performed, results, and discussion of the results. See the course schedule for a list of topics.*

## Grading Scale

|          |           |           |           |
|----------|-----------|-----------|-----------|
| 90-100%  | <b>A</b>  | 70-74.9%  | <b>C</b>  |
| 88-89.9% | <b>A-</b> | 68-69.9%  | <b>C-</b> |
| 85-87.9% | <b>B+</b> | 65-67.9%  | <b>D+</b> |
| 80-84.9% | <b>B</b>  | 60-64.9%  | <b>D</b>  |
| 78-79.9% | <b>B-</b> | 58-59.9%  | <b>D-</b> |
| 75-77.9% | <b>C+</b> | Below 58% | <b>E</b>  |

The grading scale is consistent with the university policies on grading that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

## E-Learning (Canvas)

An E-Learning course site has been developed for this course. Lecture slides, readings, homeworks, report instructions, and due dates are posted there. Make sure to check the course site regularly.

## Required Text

*Food Flavour Technology*, 2<sup>nd</sup> Edition. 2010. Andrew Taylor & Robert Linforth Eds., Wiley-Blackwell. ISBN 9781405185431 (Ebook is available by link through E-learning)

## Recommended Supplemental Reading

*Flavor Chemistry and Technology*, 2<sup>nd</sup> Edition. 2006. Gary Reineccius. CRC Press. ISBN 1566769337

*Fennema's Food Chemistry*, 2007. 4<sup>th</sup> Edition, S. Damodaran, K. Parkin, O. Fennema Eds. CRC Press.

## Attendance and Make-Up Work

This class will not be a strict lecture format. Everyone is expected to contribute to the discussion of the material, conduct experiments, and attend class. We will be performing in-class experimental work (sensory analysis, flavor replication, etc.) on a semi-weekly basis. Try not to miss the experimental work, since you will need to make-up the lab. Attendance will periodically be taken and may count towards part of your participation grade.

### *Make up Exam Policy/Late Assignments*

Requirements for class attendance and make-up exams, assignments, and other work are consistent with university policies that can be found at:

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

### **Course Schedule**

| <b>Week</b> | <b>Topic</b>   | <b>Readings</b> | <b>Critical Dates</b>                               |
|-------------|--|-----------------|---|
| 1 (8/19)    | Class Introduction. What is Flavor?  | Ch. 1 & 2       |   |
| 2 (8/26)    | What is Flavor? Flavor Impact Compounds, and Special Considerations During Flavor Creation | Ch. 1 & 2       |   |
| 3 (9/2)     | What is Flavor (continued) ( <u>No class 9/3</u> )   | Ch. 1 & 2       | Vanilla Flavored Soymilk Replication Report Due 9/5 |
| 4 (9/9)     | Flavor Analysis – Isolation  | Ch. 9           | HW 1 Due 9/10                                       |
| 5 (9/16)    | Flavor Analysis – Isolation/Identification   | Ch. 9           |   |
| 6 (9/23)    | Flavor Analysis - Identification   | Ch. 9           | HW 2 Due 9/24                                       |
| 7 (9/30)    | The Role of Sensory in Flavor Analysis   | Ch. 11          | HW 3 Due 10/1; <b>Exam 1 (10/3/18 tentative)</b>    |
| 8 (10/7)    | Flavor Biotechnology (Biocatalysis, Fermentation, Regulatory Aspects)                      | Ch. 4           | Time-Intensity Analysis Report Due 10/8             |
| 9 (10/14)   | Flavor Biotech (continued)   | Ch. 4           |   |
| 10 (10/21)  | Dairy Flavors  | Ch. 5           |   |
| 11 (10/28)  | Dairy Flavors/Survey of World Cheeses  | Ch. 5           | Cheese Descriptive Analysis Report Due 10/31        |
| 12 (11/4)   | Reaction Flavors   | Ch. 3           |   |
| 13 (11/11)  | Plant Flavors (Fruit and Vegetable Flavor) – ( <u>No class 11/12</u> )                     | Ch. 4 & 5       |   |
| 14 (11/18)  | Plant Flavors (Fruit and Vegetable Flavor) ( <u>No class 11/21 – Thanksgiving break</u> )  | Ch. 4 & 5       | Make Your Own Aroma Report Due 11/19                |
| 15 (11/25)  | Plant Flavors (continued)  | Ch. 4 & 5       | HW 4 Due 11/26<br><b>Exam 2 (11/28/18)</b>          |
| 16 (12/2)   | Final Student Projects   |                 |   |
| Finals      | Cumulative Take Home Exam  |                 | Final Exam Due Date TBD                             |

### **Final Project**

Graduate students can work in groups (up to 2 people) to design and conduct a short-term flavor chemistry project. A 20 minute seminar (100 pts) and 5 page project report (50 pts) will be submitted at the end of the semester. All students are required to attend and evaluate the graduate student presentations. Evaluation of the presentations will count as part of your participation grade.

***Topic Approval – The topic selected must have aspects different or “new” from the content covered in the by the instructor (Scoville units of different hot sauces, Lambic beer flavor, etc. are acceptable topics). Topics will need to be submitted to the instructor by 11/2/18. A one paragraph explanation of the project is required at the time of submission.***

### **Online Course Evaluation Process**

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students 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 <https://evaluations.ufl.edu>. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>.

### **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 as appropriate.

### **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.

University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575,  
[www.counseling.ufl.edu/cwc/](http://www.counseling.ufl.edu/cwc/)

Counseling Services  
Groups and Workshops  
Outreach and Consultation  
Self-Help Library  
Wellness Coaching

- U Matter We Care, [www.umatter.ufl.edu](http://www.umatter.ufl.edu)
- Career Resource Center, First Floor JWRU, 392-1601, [www.crc.ufl.edu/](http://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/](http://www.dso.ufl.edu/drc/)

### **Student Complaints:**

- Residential Course: [https://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf)