

**FOS 5437C**  
**Food Product Development Principles**  
**3 Credits, Spring 2014**

**Course Instructors and Office Hours**

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**Course Hours/Location**

Time/Location:

- M W Period 2 (8:30am – 9:20am) MCCB 2102
- T Periods 2-3 (8:30am – 10:25am) MCCB 2102, and FSHN Pilot Plant and Teaching Lab as needed and announced. If a Tuesday is designated as **Lecture**, I will only utilize period 2.

**Overall Course Objectives**

The overall goals are to provide the opportunity for students to integrate their training in food science and technology courses and related disciplines and to gain experience with the theory and practice of developing food products. Lectures and labs/discussion sessions will involve understanding and applying practices to develop food products with traditional and novel food ingredients and processes in the context of existing and projected national and international legal, regulatory, economic, environmental and social constraints. Nutritional and health implications relating to food products will be considered.

This course will help prepare the student for positions in industry, government and/or graduate/professional education. This is the IFT-required senior level capstone course that incorporates and unifies principles from the total undergraduate curriculum. Projects completed in this course may be used in IFT and other sponsored food product development competitions. This course will also serve as a node for assessment of student learning outcomes (SLOs) for graduating seniors as required by University of Florida/IFAS rules.

### **Prerequisites**

As a capstone course in the Food Science undergraduate program, it is expected and designed that success in this course is dependent on the integration of prior knowledge brought into the course. Therefore, it is departmental policy to require concurrent registration and/or completion of (3) 4000-level FOS courses as a prerequisite for registering for FOS 4435C. Undergraduate FOS majors generally register for this course in their final semester of their Food Science Program.

Enrolled graduate students in the UF/IFAS Food Science and related programs may enroll in the class (as 5437C) if they have not taken FOS 4435C or an equivalent course at another institution **and** with permission of instructor. The graduate section will have different and/or additional work assignments during the semester as compared to the undergraduate requirements; please see the Spring 2014 syllabus for details.

### **Electronic Communication and Archives**

Most lecture outlines and mini-lectures, as well as supplemental material, will be archived electronically through the UF eLearning website Sakai (<https://lss.at.ufl.edu/>) under Resources. I generally post the material for each week during the Wednesday office hours of that week. I will make occasional announcements at the “Recent Announcement” part of the site, but the most updated posted syllabus is the definitive document for due dates, lecture topics, etc. Be sure to consult it on a regular basis. For those unfamiliar with Sakai, there are tutorials available.

I will answer individual student emails promptly during stated office hours, and generally within 24 hrs at other times. Please denote FOS 4435/5437 in the “Subject” line in your emails, send them to [goodrich@ufl.edu](mailto:goodrich@ufl.edu), and utilize your official ufl.edu email account for course correspondence. It’s a good idea to keep your email inbox as empty as possible so that messages from the instructor are not rejected.

### **Class Rules**

I do not take roll for routine lecture classes (designated as **Lecture** on the syllabus), but my experience is that that classroom attendance and attention to the full lecture provides the best possibility of mastering the concepts of food science and food product development. However, attendance and promptness is required for all other sessions that involve group discussion, labs, project work, i.e. anything that is not **Lecture** on the syllabus. This will be assessed in your Group Product Individual Effort grade (Phase 4)>

Other rules for the class are simple and essentially involve common sense and courtesy towards your colleagues and the instructor: no eating or drinking in the classroom EXCEPT for reclosable water bottles and when I make special arrangements with the janitorial staff during the Phase III presentations; no side conversations; keep cell phones and other communication devices muted and stored away; if you are late, take your seat quietly and unobtrusively. Those that use laptops/tablets for note taking (not

recommended for this class) must sit at the back of the classroom so as not to distract others; please obtain instructor permission prior to use. Keep in mind that these general guidelines will be what is expected in business or government environments, as well as graduate and professional schools.

### **Textbook and References**

There is no required text for this course. However, I will have a variety of resource materials on reserve at the Marston Science Library under FOS 4435C/5437C at the Reserve Desk. Other publications of interest, including trade and scientific journals will be made available for use in Room 329, FSHN Building in 2-hour blocks of time.

#### **Reference Texts:**

Fuller, G.W. 2011. *New Food Product Development*, 3<sup>rd</sup> Edition. CRC Press, Boca Raton, FL.

Campbell-Platt, G. 2009. *Food Science and Technology*. Blackwell Publishing Ltd., Oxford, UK.

Brody, A.L. and Lord, J. 2008. *Developing New Food Products for a Changing Marketplace*, 2<sup>nd</sup> Edition. CRC Press, Boca Raton, FL.

Murano, P. 2003. *Understanding Food Science and Technology*. Wadsworth/Thompson Learning, Belmont, CA.

deMan, J.M. 1999. *Principles of Food Chemistry*, 3<sup>rd</sup> Ed. Aspen Publishers, Gaithersburg, MD.

### **Grading**

- Exams (3) 60%

*The exams will each cover approximately 1/3 of the course material. Exams 1 and 2 (100 points each) will be administered during normal class periods, while exam 3 (150 points) will be offered during the official final exam assigned time. Exam 3 will have an extra section that covers the entire course from an overview perspective. Exams are comprised of material from the lecture, assignments, readings and group project concepts. Make-up exams will only be administered with an official excuse.*

- Assignments 10%

*Assignments/exercises represent a significant part of the course grade, and their successful completion is critical in ensuring mastery of the material. Assignments are due in class in hard copy form; no late assignments will be accepted without an official excuse. There will be 12 assignments worth 5 points each; the lowest two assignments will be dropped.*

- Term Paper 10%

*Graduate students will write a term paper in the form of a scientific review paper on a food product development subject of their choice. Specific instructions will be provided early in the semester by email to students on the FOS 5435C listserv.*

- Group Product Development Project 20%

*There are three parts to this project which will have specific due dates (see course outline section). Details pertaining to the requirements for each phase will be distributed separately, although the relative point distribution and coverage for each phase, which will be assessed from a report prepared by each group is summarized here. Each group member will receive the same grade on the reports; individual contribution will be assessed in the Phase 4 portion of the project.*

*Phase 1: Abstract (50 points)*

- *Brainstorming process, project title and concept, market justification, product description, project development plan.*

*Phase 2: Development (100 points)*

- *Includes product formula, prototype, nutrition label, process flow diagram, regulatory aspects of product.*

*Phase 3: Commercialization and final report (100 points)*

- *Includes executive summary, final formula, food safety plan(s), packaging concepts, sensory or market research test, conclusions and launch/no launch justification.*

*Phase 4: Individual effort as a team member (100 points total)*

- *Team collegiality and professionalism will be assessed in this category. Unexcused absence, significant tardiness (arriving after roll call) and/or disengagement from group activities/labs/discussions/presentations as outlined in the syllabus as lab and/or discussion **or** as scheduled with group members will result in a loss of 5 points from the 50 point attendance base for each occurrence. During the semester each student will prepare and deliver a short PowerPoint presentation of 6-8 minutes on an aspect(s) of the group product development project for a total of 50 points for that effort.*

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

92 - 100 A  
 90 – 91 A-  
 88 - 89 B+  
 82 - 87 B  
 80 – 81 B-  
 78 - 79 C+  
 72 - 77 C  
 70 – 71 C-  
 68 - 69 D+

65 - 67 D  
< 65 E

This course will not be graded on a curve. Course averages will be rounded to the nearest whole number to obtain the final grade. Please consult the updated University website for additional grading information and discussion of GPA calculations:

<http://www.isis.ufl.edu/minusgrades.html>

### **Specific Course Objectives (following IFT Curriculum Requirements)**

1. The student will be able to **apply and incorporate the principles of food science in practical, real-world situations** and problems by completing a team project consisting of the development and theoretical launch of a new consumer product. This project will also allow students to **define a problem, identify potential causes and possible solutions, and make thoughtful recommendations.**
2. Students will **integrate food chemistry, food microbiology, food processing and engineering concepts** and will be able to **synthesize and explain** these various facets of a given food ingredient or commodity.
2. Students will **demonstrate written and oral communication skills** through the completion of various assignments including the authoring of a scientific review paper, the development and delivery of a PowerPoint presentation, and completing of written essay-type questions on formal exams.
3. Students will **learn to use computers to solve food science problems** by developing a PowerPoint presentation, organizing team project formulas, cost and nutritional data (Excel) and authoring a formal and informal written works in scientific format (Word).
4. Students will **understand the basic principles of sensory analysis and apply statistical principles to food science applications** through performing and reporting on team project sensory test results.
5. Students will **be aware of current topics of importance to the food industry** by completing a writing assignment reporting on a “hot topic” related to food product development and through the summarizing information learned from lectures on specific subjects (for example, BSE discussion during Meat and Poultry Products lecture).
6. Team project requires students to **work and interact with individuals from diverse cultures and work effectively with others, dealing with individual and/or group conflict.**
7. Various assignments will **require independent research of both scientific and nonscientific information**, and will **require competent use of library resources.**

8. Team project multiple milestones and course completion will **require organization skills including managing time effectively and handling multiple tasks and pressures.**

### **General Course Policy on Writing**

All writing for this course should be clear and concise (including emails to instructor, exams and particularly assignments). While this is of course a science-based class, employers and graduate/professional programs seek graduates who can communicate effectively through standard scientific and business writing. Please familiarize yourself with the Journal of Food Science as it is a major journal in our discipline and we will be following its citation style.

### **Proposed Course Outline**

#### **Week 1**

- 1/6/14: Review of syllabus and course objectives; submit signed last page of syllabus to instructor (or FSHN mailbox) by 5PM on 1/10/14. **Lecture:** The US Food Industry in a Global Context.
- 1/7/14: **Lecture:** An Overview of Food Product Development (FPD)
- 1/8/14: **Lecture:** Overview of Corporate Organization for FPD, Begin Assignment 1; Begin Term Paper

#### **Week 2**

- 1/13/14: **Lecture:** The Product Development Process; Role of R&D
- 1/14/14: **Group Project:** IFT and the IFT Student Product Development Program; Overview of FPD Group Project; Team and Group Project Assignments; Introductions and Information Exchange
- 1/15/14: **Lecture:** The Ideation and Screening Process, Assignment 1 due; Begin Assignment 2

#### **Week 3**

- 1/20/14: **No Class: UF Holiday**
- 1/21/14: **Group Project:** Work on Phase 1 of projects; review progress and organization plan with instructor
- 1/22/14: **Lecture:** FP Marketing and Market Research; Assignment 2 due; Begin Assignment 3; Provide instructor with term paper topic

#### **Week 4**

- 1/27/14: **Lecture:** Engineering and Manufacturing Aspects of FPD (Fuller, Ch. 5)
- 1/28/14: **Project Presentations:** Written report for phase I group projects due by 5pm (hard copy); group presentations (6-8 min each – groups 1 through 8 in order)

1/29/14: **Project Presentations:** continued from 1/28/14 if necessary; **Lecture:** Legal and Fiscal Aspects of FPD; Assignment 3 due

### **Week 5**

2/3/14: **Lecture:** Legal and Fiscal (con't.); Exam 1 review

2/4/14: **Exam #1** (75 minutes; closed book)

2/5/14: **Lecture:** Technical Aspects of NPD – Dairy (1); Begin Assignment 4

### **Week 6**

2/10/14: **Lecture:** Technical Aspects of NPD – Dairy (2)

2/11/14: **Laboratory Session:** Begin Assignment 5 – The Butter Lab. **Instructions:** Report to FSHN Pilot Plant and be ready to take notes and get started by 8:45am; Assignment 4 due.

2/12/14: **Lecture:** Technical Aspects of NPD – Meat, Poultry, and Egg Products

### **Week 7**

2/17/14: **Lecture:** Technical Aspects of NPD – Juices and Non-alcoholic Beverages

2/18/14: **Group Project:** Phase 2 Project Guidelines; Work on group projects; Assignment 5 due

2/19/14: **Lecture:** QC/QA Aspects of NPD; Begin Assignment 6

### **Week 8**

2/24/14: **Lecture:** Microbial Aspects of NPD (Dr. K. Schneider; [keiths29@ufl.edu](mailto:keiths29@ufl.edu)); Draft of term paper due for review (optional but highly recommended)

2/25/14: **Lecture:** Technical Aspects of NPD – Formulas and Calculations

2/26/14: **Lecture:** Technical Aspects of NPD – Cereals and Grains; Assignment 6 due; Begin Assignment 7; Term paper draft returned with comments

### **Week 9**

UF Spring Break: 3/1/14 – 3/8/14; no classes

### **Week 10**

3/10/14: **Lecture:** Shelf Life of Packaged Foods

3/11/14: **Group Project:** Progress review by instructor; Work on group projects

3/12/14: **Lecture:** Technical Aspects of NPD – Fish and Shellfish Products; Assignment 7 due

### **Week 11**

3/17/14: **Lecture:** Technical Aspects of NPD – Fruits and Vegetables; brief exam 2 review

3/18/14: **Exam #2** (75 minutes, closed book)

3/19/14: **Lecture:** Technical Aspect of NPD – Fats and Oils

### **Week 12**

3/24/14: **Lecture:** Technical Aspects of NPD – Flavors and Flavor Companies; Begin Assignment 8; Final copy of term paper due (electronic copy in Word)

3/25/14: **Project Presentations:** Phase 2 12-16 minute presentations (Groups 3-8)

3/26/14: **Project Presentations:** Phase 2 12-16 min presentations (Groups 1-2);

### **Week 13**

3/31/14: **Lecture:** Technical Aspects of NPD – Package Development; Written Phase 2 Report due by 5pm (hard copy)

4/1/14: **Lecture:** Technical Aspects of NPD – Nutrients and Fortification; Assignment 8 due

4/2/14: **Lecture:** Technical Aspects of NPD – Labeling and Pertinent Regulations; Begin Assignment 9

### **Week 14**

4/7/14: **Lecture:** Technical Aspects of NPD – Sugar, Candy and Chocolate

4/8/14: **Group Project:** Phase 3 guidelines; Work on group projects; Assignment 9 due; Begin Assignment 10

4/9/14: **Lecture:** Technical Aspects of NPD – Test Markets and Launches, Successes and Failure

### **Week 15**

4/14/14: **Lecture:** Technical Aspects of NPD – Fermentations, Enzymes, and Bioprocessing; Assignment 10 due; Begin Assignment 11

4/15/14: **Project Presentations:** Phase 3 12-16 min presentations (groups 8-3, in reverse order)

4/16/14: **Project Presentations:** Phase 3 15-min presentations (groups 2-1); Begin Assignment 12

### **Week 16**

4/21/14: **Lecture:** Food Service and Food Ingredient PD; Assignment 11 due

4/22/14: **Mini-Lecture:** Project Management and Good Workplace Practices; Written portion of Phase 3 group projects due by 5pm (hard copy)

4/23/14: **Lecture:** Summary Overview of FPD and exam 3 review; last day of classes for Spring 2014 semester; Assignment 12 due

### **Week 17**

4/30/14: **Exam #3 (2 hours, closed book). 5:30 – 7:30 PM, Location: MCCB 2102**



## **Information for All Students**

### **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, Reference Material, Computer Programs, and Electronic Databases:**

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.

### **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, 392-117, 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.

This confirms that I've read and understand the syllabus for 2014 Food Product Development.

Student Signature and Date: \_\_\_\_\_

Preferred Name in Class: \_\_\_\_\_

Miscellaneous Info about You (optional)

Favorite Area or Class in Food Science Program to date?

Future Professional Plans?

What you hope to get out of Food Product Development class?

Favorite Food(s):