

FOS 4435C
Food Product Development: Principles and Practice
Current Syllabus
3 Credits, Spring 2021

Course Instructors and Office Hours

Renée Goodrich Schneider, Professor
Food Science and Human Nutrition Department
Room 349, FSHN Building, Newell Drive
Phone: 352-294-3726
Email: goodrich@ufl.edu
Virtual Office Hours: Wednesday, 1-2pm; Thursday, 9-10am; or by appointment

Amy Jones, Teaching Assistant and Food Science Doctoral Candidate
Email: ajone54@ufl.edu

Course Hours/Location

Time/Location:

- M W Period 2 (8:30am – 9:20am): Zoom Link or Weimer 1076
- T Periods 2-3 (8:30am – 10:25am): Zoom -OR- FSHN Pilot Plant and Teaching Lab as needed and announced. If a Tuesday is designated as **Lecture**, we will normally only utilize period 2 and Zoom will be the medium of delivery.
- Course Zoom Link/Meeting ID/Password for all sections of the course
 - <https://ufl.zoom.us/j/98905195752?pwd=M00vaUxtMzhsS1p0SGY5cEZCayt1QT09>
 - Meeting ID: 989 0519 5752
 - Passcode: 673491

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.

For **graduate students** who are entering the field of food science from another institution and/or another major, this course will serve as a foundation for many food science and technology research areas and will provide a basis for an introduction and then more thorough understanding of the discipline of food science.

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.

Graduate students in 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 refer to *Spring 2021 FOS 5437C* 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 Canvas (<https://lss.at.ufl.edu/>) under Resources. I generally post the material for each week on the weekend prior to 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 Canvas, there are tutorials available.

I will answer individual student emails promptly during stated office hours, and generally within 24-48 hrs at other times, if you denote FOS 4435/5437 in the “Subject” line in your email. Please send them to 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 instructors 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 classroom/virtual 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 designated **Lecture** on the syllabus. This is consistent with university policies that can be found at: <https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Other rules for the class are simple and essentially involve common sense and courtesy towards your colleagues and the instructor. Classroom: masks at all times; physical distancing; no eating or drinking in the classroom EXCEPT for reclosable water bottles; no side conversations; keep cell phones and other communication devices muted and stored away; if you are late, take your seat quietly and unobtrusively. If you use laptops/tablets for note taking, please “type” quietly and do not distract your neighbors. Virtual Classroom/Zoom: please mute yourselves when not in active discussion; you are welcome to turn your video off after lecture starts; please don’t drive while on Zoom.

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 virtual 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 349, FSHN Building in 2-hour blocks of time should COVID-19 regulations permit.

Reference Texts:

Aramouni, F. and Deschenes, K. 2015. Methods for Developing New Food Products. DEStech Publications, Inc., Lancaster, PA.

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

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

deMan, J.M. 1999. Principles of Food Chemistry, 3rd Ed. Aspen Publishers, Gaithersburg, MD.

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

Heagney, J. 2012. *Fundamentals of Project Management*, 4th Ed. American Management Association, New York.

Moskowitz, H., Saguy, I. S., and Straus, T. 2009. *An Integrated Approach to New Food Product Development*. CRC Press, Boca Raton, FL.

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

Grading

- Exams (3) 55%

The exams will each cover approximately 1/3 of the course material. Exams 1 and 2 (100 points each) will be administered in person during Tuesday 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, suggested readings and group project concepts. Make-up exams will only be administered with an official excuse. Currently, exams are scheduled to take place on-campus, although instructor reserves the right to change format/times should it become prudent to do so. All changes will be announced at least a week in advance of any exam.

- Assignments 25%

Assignments/exercises represent a significant part of the course grade, and their successful completion is critical in ensuring mastery of the material. Assignments should be submitted as directed; no late assignments will be accepted without an official excuse. There will be 5 small assignments worth 25 points each; the lowest assignment grade will be dropped. The Butter Lab (50 pts) will be considered an additional assignment (learning activity), as well as a Label requirement-related learning activity (also worth 50 pts). Graduate students will prepare a special assignment for 100 points (see separate rubric).

- 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 (the first 3 phases; 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 at least one short PowerPoint presentation or portion of a presentation (at least 10 minutes speaking time) 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

Zoom = Tuesday (usually) all sections attend via Zoom link

HyFlex = Monday, Wednesday sections are conducted by Zoom or in person, depending on section number

F2F = Tuesday (usually) activity will take place in FSHN facilities using COVID-19 compatible practices

Week 1

- 1.11.21: HyFlex Lecture: The US food industry in a global context. **Activity**: Review of syllabus and course objectives; submit signed last page (p. 11) of syllabus to instructor (or FSHN mailbox) by 5PM on 1.20.21
- 1.12.21: Zoom Group Project: Overview of FPD group project; IFT and corporate student product development programs. **Mini-Lecture**: Principles of effective teamwork
- 1.13.21: HyFlex Lecture: Corporate organization of food companies (Brody, Chap. 7); An overview of food product development (FPD) (Brody, Chap. 4); Begin Assignment 1

Week 2

- 1.18.21: **Holiday – No Class**
- 1.19.21: Zoom Group Project: Phase 1 specific requirements: report and presentation; Project group assignments and introductions; Review initial project plan with instructor
- 1.20.21: HyFlex Lecture: Food product development process (con't.); Assignment 1 due

Week 3

- 1.25.21: HyFlex Lecture: The ideation and screening process
- 1.26.21: Zoom Lecture: FP marketing and market research
- 1.27.21: HyFlex Lecture: Process development in FPD & manufacturing principles

Week 4

- 2.1.21: HyFlex Lecture: New product development case studies – elements and examples
- 2.2.21: Zoom Group Project: Group presentations (10 min each – groups 1 through x in order); Written report for phase 1 group projects due by 5pm (electronic copy, one each per group)
- 2.3.21: HyFlex Lecture: Legal and financial aspects of FPD; Exam 1 cut-off

Week 5

- 2.8.21: Zoom Lecture: Microbial aspects of NPD (Dr. K. Schneider; keiths29@ufl.edu)
- 2.9.21: F2F Exam: Exam 1 (60 minutes, closed book/notes); On-campus location to be assigned
- 2.10.21: Zoom Lecture: Micro (con't.); Begin Assignment 2

Week 6

- 2.15.21: HyFlex **Lecture:** Food Product Development for Kids – Insights (Moskowitz et al., Chap. 13)
- 2.16.21: Zoom: **Group Project:** Phase 2 project guidelines; Work on group projects; Begin graduate paper (graduate students only; see rubric)
- 2.17.21: HyFlex: **Lecture:** Technical aspects of NPD – Dairy (1) with organic fluid milk case study; Assignment 2 due

Week 7

- 2.22.21: HyFlex **Lecture:** Technical aspects of NPD – Dairy (2) with probiotic yogurt case study
- 2.23.21: F2F **Laboratory Session:** Begin Learning Activity (1) **The Butter Lab.**
Instructions: Report to FSHN Pilot Plant and be ready to take notes and get started by 8:30am
- 2.24.21: HyFlex **Lecture:** QC/QA Aspects of FPD Part 1 – Quality management

Week 8

- 3.1.21: Hyflex **Lecture:** QC/QA aspects of FPD Part 2 - Food safety hazards, food safety programs & FSMA
- 3.2.21: Zoom **Group Project:** Progress review by instructor; Work on group projects; Butter Lab report due
- 3.3.21 Hyflex **Lecture:** Packaging development and shelf life of packaged foods

Week 9

- 3.8.21: HyFlex **Lecture:** Packaging development and shelf life of packaged foods (con't.); end of material for Exam 2
- 3.9.21: F2F **Exam #2** (75 minutes, closed book/notes)
- 3.10.21: HyFlex **Lecture:** Technical Aspects of NPD – Fruits and vegetables with fresh-cut potato side dish case study

Week 10

- 3.15.21: HyFlex **Lecture:** Technical aspects of NPD - Food ingredient PD and use; Begin Assignment 3
- 3.16.21: Zoom **Project Presentations:** Phase 2 20-minute presentations (Groups x through 1)
- 3.17.21: Zoom or HyFlex (TBD) **Lecture:** Finish presentations (if necessary); Technical aspects of NPD – Flavors and working with flavor companies; Phase 2 report due by 5PM (electronic copy; one per group)

Week 11

- 3.22.21: HyFlex **Lecture:** Technical aspects of NPD – Nutrients and fortification; Assignment 3 due
- 3.23.21: Zoom **Group Project:** Phase 3 deliverables presentation; Begin work on Phase 3 of project

3.24.21: **No Lecture! UF Recharge Day**

Week 12

3.29.21: HyFlex **Lecture:** Technical Aspects of NPD – Labeling and pertinent regulations – Begin Learning Activity 2 assignment

3.30.21: Zoom **Mini-Lecture:** Reverse engineering of existing food products **Group Project:** Instructor check in and work on group projects; grad student reviewed drafts returned with comments

3.31.21: HyFlex **Lecture:** Technical aspects of NPD – Cereals and grains with case study on gluten-free products

Week 13

4.4.21: HyFlex **Lecture:** Technical aspects of NPD – Fish and shellfish products with chilled seafood entrée case study; Learning Activity 2 assignment due; Begin Assignment 4

4.5.21: Zoom **Mini-Lecture:** Technical aspects of NPD – Fats and oils with heart healthy oil case study; **Group Project:** Work on project; check in w/ instructor

4.6.21: HyFlex **Lecture:** Technical aspects of NPD – Sugar, candy and chocolate with monk fruit sweetener case study

Week 14

4.12.21: HyFlex **Lecture:** Technical Aspects of NPD – Fermentations, Enzymes, and Bioprocessing with case study on kombucha tea; Assignment 4 due; Begin Assignment 5

4.13.21: Zoom **Mini-Lecture:** Technical aspects of meats and lab-grown proteins; **Group Project:** Wrap up project for next week; check in w/ instructor

4.14.21: HyFlex **Lecture:** Technical Aspects of NPD – Food Service FPD with chain restaurant menu item case study

Week 15

4.19.21: HyFlex **Lecture:** Technical Aspects of NPD – Test markets and launches, successes and failure; Assignment 5 due

4.20.21: Zoom **Project Presentations:** Phase 3 20-min presentations; Groups 1 through x, in order

4.21.21: HyFlex or Zoom (TBD) **Course Wrap Up:** Finish presentations (if necessary); Written portion of Phase 3 group projects due by 5pm (electronic copy, one each per group); Exam 3 review; Last day of classes for Spring 2021 semester—thank you!

Week 16

4.26.21: Graduate paper due (graduate students only)

4.30.21: **Exam #3 (1.5 hours, closed book/notes or TBD); official assignment time is 4.30.21 12:30 to 2:30pm; Please note that this day is University-wide**

Commencement and I will offer the exam at an earlier date/time during finals week (Week 16; date/time/format TBD)

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.

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>.

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.

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; for more information please visit 0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

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/ Counseling Services Groups and Workshops; Outreach and Consultation; Self-Help Library; Wellness Coaching
- U Matter We Care, www.umatter.ufl.edu/
- Career Resource Center, First Floor JWRU, 392-1601, www.crc.ufl.edu/

Please return this page to instructor by end of the first week of classes (via email scan to goodrich@ufl.edu; mail slot in front office; or in person---thank you!)

This confirms that I've read and understand the syllabus for 2021 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):