FOS 4435C
Food Product Development: Principles and Practice
Current Syllabus
3 Credits, Spring 2026

Course Instructor and Office Hours

Keith R. Schneider, Professor
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Course Hours/Location

Time/Location:

- M W Period 2 (8:30 am – 9:20 am): Weimer 1076
- T Periods 2-3 (8:30 am – 10:25 am): Weimer 1076 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 for that lecture

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 the assessment of student learning outcomes (SLOs) for graduating seniors as required by the 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 the 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 the permission of the instructor. The graduate section will have different and/or additional work assignments during the semester as compared to the undergraduate requirements; please refer to the ***Spring 2026 FOS 5437C*** syllabus for grading details.

Electronic Communication and Archives

Most lecture outlines and mini-lectures, as well as supplemental materials, will be archived electronically on the UF eLearning website, Canvas (https://lss.at.ufl.edu/), under the Resources section. I generally post the material for each week on the weekend the material is presented. 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 regularly. 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 hr at other times if you denote FOS 4435/5437 in the "Subject" line in your email. Please send them to keiths29@ufl.edu and utilize your official ufl.edu email account for course correspondence. Please **do not** use Canvas mail, as I do not check that as frequently as my university account. This will ensure a prompt response to your inquiries. Also, 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 I have found that classroom/virtual classroom attendance provides the best opportunity for mastering the concepts of food science and food product development. However, **attendance and promptness are required** for all other sessions that involve group discussion, labs, and 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. Additionally, there is no eating or drinking in the classroom, except for reclosable water bottles. Please refrain from 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.

Keep in mind that these general guidelines are what is expected in business, government, graduate, and professional schools.

Textbook and References

There is no required text for this course. Many of the recommended materials are available on reserve at the Marston Science Library under FOS 4435C/5437C at the Reserve Desk or electronically through the UF library system. Other publications of interest, including trade and scientific journals, will be made available for use in AFPL Room 210 (my office), in 2-hour blocks of time.

Reference Texts:

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

Beckley, J.H., L.J. Herzog and M.M. Foley. 2017. Accelerating New Food Product Design and Development, 2nd Edition. Wiley-Blackwell, Hoboken, NJ. (not free)

Brody, A.L. and Lord, J. 2008. Developing New Food Products for a Changing Marketplace, 2nd Edition. CRC Press, Boca Raton, FL. (not free)

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

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

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

Grading

- Exams (3) 60%

The exams will each cover approximately 1/3 of the course material. The exams (100 points each) will be administered in-person during Tuesday class double-periods. 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 in person and on campus, although the 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. The total points for this part of the course is 300.

- Assignments 20%

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 five assignments, each worth 20 points; the lowest assignment grade will be dropped. Material from the assignments will likely appear on exams. Graduate students will prepare an additional, comprehensive assignment for 100 points, which is not optional (see separate syllabus). The total points for this part of the course are 100 (UG) and 200 (Grad).

- Group Product Development Project 20%

This project consists of three major parts, each with specific due dates (see the course outline section), as well as a group presentation at the end of the semester. Details pertaining to the requirements for each phase will be distributed separately, although the relative point distribution and coverage, which will be assessed based on reports prepared by each group, are summarized below. ***Unexcused absences from Tuesday group or lab sessions, 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 those scheduled with group members, will result in loss of points in this section****. Up to 5 points for each phase will be deducted for non-participation. Each group member will receive the same grade on the reports and the final presentation, minus any points deducted. Individual effort will be evaluated by the instructor and TA and will be awarded as extra credit. Total points for this part of the course are 100.*

Phase 1: Ideation and product justification – brief report (1) (25 points)

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

Phase 2: Initial product development – brief report (2) (25 points)

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

Phase 3: Refined product development and comprehensive final report (50 points)

- *Includes executive summary, final formula, food safety plan(s), packaging concepts, sensory or market research test, conclusions, and launch/no launch justification. Include all previous report material, edited/updated as needed.*

Phase 4: Presentation and team collegiality (10 points) ***(Extra Credit)***

- *Final team presentation (all members must present; 10 points)*

- *Team collegiality and professionalism will be assessed through peer evaluation (5 points) and instructor assessment (5 points). These scores will be used as **Extra Credit.** This will be an individual score of 10 total points, presentation grade, and will be added to the total class score.*

The total points available will be 500 (510 with 10 pts of extra credit)

Course Average Grade Equivalents:

92 – 100 A	(460-500)
90 – 91 A-	(450-460)
88 – 89 B+	(440-449)
82 – 87 B	(410-439)
80 – 81 B-	(400-409)
78 – 79 C+	(390-399)
72 – 77 C	(360-389)
70 – 71 C-	(350-359)
68 – 69 D+	(340-349)
65 – 67 D	(325-339)
< 65 E	(0-324)

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: https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/#gradingpoliciestext

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 concepts from food chemistry, food microbiology, food processing, and engineering,** and will be able to **synthesize and explain** the various facets of a given food ingredient or commodity.

3. Students will **demonstrate their written and oral communication skills** through the completion of various assignments, including authoring a project paper, developing and delivering a PowerPoint presentation, and completing written essay-type questions on formal exams.

4. 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 formal and informal written works in scientific format (Word).

5. Students will **understand the basic principles of sensory analysis and apply statistical principles to food science applications** by performing and reporting on their team's sensory test results.

6. 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 summarizing information learned from lectures on specific subjects, for example, BSE (mad cow disease) discussion during the Meat and Poultry Products lecture.

7. Team projects require students to **work and interact with individuals from diverse backgrounds**, **working effectively with others and dealing with individual and/or group conflicts.**

8. Various assignments will **require independent research of both scientific and nonscientific information** and will **require competent use of library resources.**

9. 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 the instructor, exams and particularly assignments). While this course is 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. All work is to be original work written by the student. **The use of ChatGPT or other AI bots is not allowed unless otherwise noted.**

Proposed Course Outline

Week 1

Jan 12 ***Lecture***: The US food industry (Brody, Chap. 7); review of the syllabus; submit signed last page (p. 11) of the syllabus to the instructor by 11:59 pm on 1-15-25

Jan 13: ***Group Project Discussion:*** Overview of FPD group project and rubric

Jan 14: ***Lecture:*** Organizational structure for food product development (Brody, Chap. 7 or Fuller Chap 4-5)
Begin Assignment 1

Week 2

Jan 19: ***Holiday – No Class***

Jan 20: ***Group Project Discussion:*** Phase 1 specific requirements and report format; project group assignments and introductions; review initial communication strategy with the instructor before leaving the classroom

Jan 21: ***Lecture:*** Food product development process (con't)
Assignment 1 due

Week 3

Jan 26: ***Lecture:*** The ideation and screening process

Jan 27: ***Lecture:*** FP marketing and market research

Jan 28: ***Lecture:*** Process development in FPD & manufacturing principles
Begin Assignment 2

Week 4

Feb 2: ***Lecture:*** Process development in FPD & manufacturing principles (Moved)
Lecture: Legal and financial aspects of FPD

Feb 3: ***Group Project:*** Progress check with instructor and project work session

Feb 4: ***Lecture:*** Technical Aspects of NPD – food trends over time with a closer look at convenience as a new product driver
Assignment 2 due Wednesday, February 5, 2025; **Exam 1 cut-off**

Week 5

Feb 9: ***Lecture:*** Food Product Development for Kids – Insights (Moskowitz et al., Chap. 13)

Feb 10: ***Exam***: Exam 1 (90 min, closed book/notes/computer)

Feb 11: ***Lecture:*** QC/QA Aspects of FPD Part 1: FSMA and other food safety regulations related to FPD
Written report for phase 1 group projects due by February 12th, 5 pm (electronic copy, email to keiths29@ufl.edu and copy teammates; one report per group)

Week 6

Feb 16: ***Lecture:*** Technical aspects of NPD – Formulating organic food products.
Begin Assignment 3

Feb 17: ***Group Project Discussion:*** Phase 2 project guideline
Work on group projects
Graduate students begin paper/product (graduate students only; see rubric)

Feb 18: ***Lecture:*** Microbial aspects of NPD

Week 7

Feb 23: ***Lecture:*** Microbiological Concerns Part 2

Feb 24: ***Demo/Product Sampling Session***: Assignment 4 – Prebiotic, probiotic, and fermented ingredients, and food products. *Instructions: Report to FSHN Pilot Plant and be ready to take notes and get started by 8:45 am.*
Assignment 3 due February 26th, 5:00 pm.
Review Assignment 4 handout and associated reading (posted in assignments)

Feb 25: ***Lecture:*** NPD – Formulating with prebiotics and probiotics ***AND*** Technical Aspects of NPD – Sourcing food ingredients

Week 8

March 2: ***Lecture:*** Technical aspects of NPD – Flavors and working with flavor companies

March 3: ***Group Project:*** Progress review by instructor; Work on group projects

March 4: ***Lecture:*** Packaging development and shelf life of packaged food
Assignment 4 due March 5th, 5:00 pm.

Week 9

March 9: ***Lecture:*** Packaging development and shelf life of packaged foods (con't)
End of material for Exam 2

March 10: ***Exam #2*** (90 min closed book/notes/computer)

March 11: ***Lecture:*** Reverse engineering of existing food products

Week 10

March 16 - 18: Spring Break – No classes

Week 11

March 23: ***Lecture:*** Technical aspects of NPD – food ingredient PD

March 24: ***Group Project:*** In-class work session
Written report for phase 2 group projects due by March 26th, 11:59 pm (electronic copy, one each per group, email to keiths29@ufl.edu, copy teammates)

March 25: ***Lecture:*** Legal and financial aspects of FPD
Begin Assignment 5

Week 12

March 30: ***Lecture:*** Health and wellness in FPD: trends and strategies for meeting consumer needs

March 31: ***Group Project Presentation:*** Phase 3 deliverables
Begin work on Phase 3 of the project

April 1: ***Lecture:*** Technical aspects of NPD – Nutrients and fortification
Assignment 5 due

Week 13

April 6: ***Lecture:*** Technical Aspects of NPD – Labeling of food products
April 7: ***Lecture:*** Labeling (con't)
April 8: ***Lecture:*** QC/QA aspects of FPD Part 2 – Food safety hazards analysis for new products and implementing a food safety plan

Week 14

April 13: ***Lecture:*** QC/QA aspects of NPD Part 2
April 14: ***Group Project:*** Final workday
Lecture: Influence of the restaurant industry on NPD
April 15: **Exam #3**

Week 15

April 20: ***Group Project Presentations:*** Project presentations (15 – 20 min); Groups 1 - 3
April 21: ***Group Project Presentations:*** Project presentations (15 – 20 min); Groups 4 - 6
April 22: ***Group Project Presentations:*** Project presentations (15 – 20 min); Groups 7 – 8
Course Wrap-Up: Last day of classes for Spring 2025 semester – Thank you!

Academic Policies and Resources

Academic policies for this course are consistent with university policies. See https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/

Campus Health and Wellness Resources

Visit https://one.uf.edu/whole-gator/topics for resources that are designed to help you thrive physically, mentally, and emotionally at UF. Please contact UMatterWeCare for additional and immediate support.

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.

Privacy and Accessibility Policies

[required for online courses, list all technology used]

- Instructure (Canvas)
  - Instructure Privacy Policy
  - Instructure Accessibility
- Zoom
  - Zoom Privacy Policy
  - Zoom Accessibility

Please return this page to the instructor by the end of the first week of classes (via email scan to keiths29@ufl.edu; mail slot in the front office; or in person – thank you!)

This confirms that I've read and understand the syllabus for 2024 Food Product Development.

Student Signature and Date: _____

Preferred Name in Class: _____

Miscellaneous Info about yourself (optional)

Favorite area or class in the Food Science program to date?

Future professional plans?

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

Favorite food(s):