

**FOS 5437C**  
**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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Office Hours: Thursday, 10-11 am; or by appointment

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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 information in this 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](mailto: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, 2<sup>nd</sup> 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, 3<sup>rd</sup> 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 5 assignments worth 20 points each; 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 grad assignment in this syllabus). The total points for this part of the course are 100 (UG) and 200 (Grad).*

***The total points for all assignments will be divided by two when calculating total grade points.***

- Group Product Development Project 20%

*There are three major parts to this project which will have specific due dates (see 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 from 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 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 scored through a peer evaluation and will be added 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:

<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 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  
**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  
**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 12<sup>th</sup>, 5 pm (electronic copy, email to [keiths29@ufl.edu](mailto: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 26<sup>th</sup>, 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 5<sup>th</sup>, 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 26<sup>th</sup>, 11:59 pm  
(electronic copy, one each per group, email to [keiths29@ufl.edu](mailto: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

April 15: **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!

### **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/](http://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/](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/)

**Secondary Product and Term Paper**

**100 points**

**Topic review/approval (Week 3)**

**Draft review (optional, but highly recommended)**

**Term paper due April 17th, 2026**

**Format**

The objective of a secondary product and review paper is to examine a second product that relates to a particular topic (such as Food as Medicine or new Food

Recommendations). You may focus on the microbiology, chemistry, processing, or other area pertaining to the use specific ingredient, product, process, etc., depending on your particular area of interest. While I don't want to set a specific page requirement, I anticipate a paper of approximately 5-7 pages in length could properly cover a given topic. You can produce a second product, but it is not necessary.

**Grading Metrics**

Scientific merit of reviewed papers 50%

Product design, summary and conclusions 20%

Citations and references 10%

Organization 10%

Quality of writing and attention to detail 10%

**Example Topics/Past Papers (as a suggestion)**

Considerations for the use of probiotics in food formulations

Development of masking formulas in the flavor industry

How food regulations drive reformulation: case studies in sugar and salt

New high-protein recommendation

Evaluation of gluten-free baked goods technologies

Food as medicine

**Please return this page to instructor by end of the first week of classes (via email scan to [keiths29@ufl.edu](mailto:keiths29@ufl.edu); mail slot in 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 Food Science Program to date?

Future Professional Plans?

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

Favorite Food(s):