

FOS 6936 Food Toxicology (Topics in Food Science)
Section 26372, 3 Credits, Fall 2021
Proposed Course Syllabus

Course Instructor and Office Hours

Renée Goodrich, Professor
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Email: goodrich@ufl.edu
Office Hours: Thursday, 1-3pm or Zoom by appointment

Dr. Goodrich will be responsible for overall coordination and administration of the course. She will share instructional duties with guest lecturers occasionally throughout the course. Please consult the course outline for specific lecture dates and discussion topics.

Course Hours/Location

Official Time/Location:

- M, W, F Period 3 (9:35-10:25am), MCCB 1108

Lake Alfred Students:

- Via Zoom link from the Citrus research & Education Center campus:
<https://ufl.zoom.us/j/93327426589>

We will meet the first day of class (8/23/21). Please review current UF health and safety information/expected practices, which may be updated throughout the Fall 2021 semester.

Course Objectives

The overall objective of this course is to introduce the advanced student to the discipline of food toxicology, building on the cornerstones of the field of toxicology, including dose response, toxicokinetics, metabolism, biotransformation, toxicity testing and risk analysis. Principles will be illustrated with food-related examples as appropriate. Specific types of foodborne toxins will then be studied, including naturally occurring toxins, toxins of microbial origin, food additives including nutrients, heavy metals, environmental contaminants and processing-derived toxins such as acrylamide. Coverage of specific classes of food-related toxicological compounds will include occurrence, physiological effects, chemistry, mitigation strategies and regulatory standards where applicable. A broad goal of the instructor is to provide sufficient background and learning opportunity for the student to understand and discuss food toxicological issues competently as a scientist-citizen.

Prerequisites

This is graduate-level course. Requirements include an undergraduate degree in food science, human nutrition, animal sciences, public health, or other scientific discipline, including the life and physical sciences. Previous coursework in toxicology is not required, as the basic principles of toxicology will be covered in the first section of course. Previous coursework in biochemistry is recommended.

Course Format

Students will acquire knowledge of the pertinent issues in food toxicology through the use of lectures, class discussions, outside reading, peer presentations, and assignments. As a convenience to the student, lecture outlines will be generally be posted to the UF eLearning Website on Canvas by 8AM the day of each corresponding lecture: <https://elearning.ufl.edu/> We will use the Canvas site for archiving lectures, materials, assignments, etc. Please use instructor's email for course correspondence (goodrich@ufl.edu), using "Food Toxicology" in the subject line. Materials and instructions for class discussion and assignments will be emailed to all registered students; please keep your inbox up-to-date.

Textbook and References

A note on readings:

Suggested background readings are noted in the course syllabus and are associated with each major topic. I have provided these for the student who wishes to read ahead in preparation for the lecture (note abbreviations used in the following list). Lecture notes will contain the references from which the lecture was developed, along with supplemental material. These will be noted as "Resources" on the last slide of each set. Better performance in any given class is generally linked to student effort and attention both in class **and** outside of the classroom.

Recommended textbook:

Püssa, Tõnu. 2014. Principles of Food Toxicology, 2nd Edition. CRC Press, LLC. Boca Raton, FL. -- (P)

This text will be on reserve at the Marston Science Library under FOS 6936 Section 26372 and be available for purchase from the UF bookstores. The text will also be made available for use in Room 349, FSHN Building, where additional supplemental texts may also be reviewed for 2-hour periods.

Supplemental texts:

Shibamoto, T. and Bjeldanes, L. 2009. Introduction to Food Toxicology, 2nd Ed. Elsevier Inc., Burlington, MA. -- (SB)

Shaw, Ian. 2013. Food Safety: The Science of Keeping Food Safe. Wiley-Blackwell. Chichester, UK. -- (S)

Klaassen, Curtis (Ed.). 2013. Caserett and Doull's Toxicology, 8th Edition. McGraw-Hill. New York, NY. -- (CD)

Grading

- Exams (4) 60% (15% each)

Exams 1-3 (short, closed book exams) will each cover approximately 1/3 of the course material and be equally weighted. However, later course material will draw on foundation material presented in the first section of the course; students should therefore be prepared to apply principles from the entire course as they develop their answers to assignments and exams. The final exam will be a comprehensive, open book exam that will allow the student to demonstrate an understanding and synthesis of the concepts of food toxicology from the entire course.

- Assignments/Exercises 40%

Assignments/exercises represent a significant part of the course grade, and their successful completion is critical. One of these assignments will be a short presentation (20 minutes), in the form of a scientific review summary on a particular topic relevant to food toxicologists. Please adhere to stated deadlines for maximum credit. Attendance and punctuality will be noted; class will start promptly at 9:35am.

Course Average Grade Equivalents:

90 - 100 A
88 - 89 B+
80 - 87 B
78 - 79 C+
70 - 77 C
68 - 69 D+
60 - 67 D
≤ 59 E

Exams may be graded on a curve at the instructor's discretion. Final scores will be rounded to the nearest whole number to obtain letter grades. Minus grades will not be utilized in this course. For further information about UF policy on grades, please consult the official UF website: <http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

Proposed Course Outline

Week 1

8/23/21: **Lecture:** Introduction to course; review of syllabus and course objectives; introduction and short history of toxicology. (CD, Chap. 1)

- 8/25/21: **Lecture:** Dose-response; interactions of toxic substances; classification of toxicants. (SB, Chap. 1; P, Chap. 1)
- 8/27/21: **Lecture:** Toxicology-related principles of cellular biology and biochemistry. (P, Chap. 1; general biochemistry texts)

Week 2

- 8/30/21: **Lecture:** Introduction to toxicokinetics; fate of xenobiotics
- 9/1/21: **Lecture:** Routes of xenobiotics in organisms (entry, absorption, distribution). (SB, Chap. 1; CD, Chap. 5)
- 9/3/21: **Lecture:** Routes of xenobiotics in organisms (biotransformation and enzymes). Begin Assignment 1.

Week 3

- 9/6/21: No class – UF holiday.
- 9/8/21: **Lecture:** Routes of xenobiotics in organisms (excretion). (SB, Chap. 3)
- 9/10/21: **Lecture/Discussion:** Toxicokinetics – additional considerations and summary lecture; Assignment 1 due.

Week 4

- 9/13/21: **Lecture:** Toxic response (other than carcinogenesis). (P, Chap. 3; SB, Chap. 2); Begin assignment 2
- 9/15/21: **Lecture:** Toxic response (con't.)
- 9/17/21: **Lecture:** Toxic response - carcinogenesis (SB, Chap. 4)

Week 5

- 9/20/21: **Lecture/Discussion:** Toxic response – summary
- 9/22/21: **Exam 1:** 50 minutes, closed book; Assignment 2 due
- 9/24/21: **Lecture:** Analytical determination of toxic compounds. (SB, Chap. 2; P, Chap. 4); Begin Assignment 3 (general scientific presentation).

Week 6

- 9/27/21: **Lecture:** Evaluation of toxicity of substances – toxicity testing (1). (SB, Chap. 2)
- 9/29/21: **Lecture:** Evaluation of toxicity of substances – toxicity testing (2). (SB, Chap. 2)
- 10/1/21: **Lecture:** Toxicity testing (3) and regulatory considerations. Begin Assignment 4.

Week 7

- 10/4/21: **Lecture/Discussion:** Toxicological safety, risk analysis and policy. (P, Chap. 6; CD, Chap. 4) (Dr. D. Archer, dlarcher@ufl.edu)
- 10/6/21: **Lecture/Discussion:** Risk analysis and public health (con't.)
- 10/8/21: **UF Holiday – Homecoming;** no class

Week 8

- 10/11/21: **Lecture:** Marine food toxins (Dr. K. Schneider, keiths29@ufl.edu). (SB, Chap. 5); Assignment 4 due.
- 10/13/21: **Lecture:** Animal endogenous toxins; veterinary drugs and prions (SB, Chap. 5)
- 10/15/21: **Lecture:** Mycotoxins. (SB, Chap. 7); Assignment 3 presentation topic approval due (email to instructor is fine).

Week 9

- 10/18/21: **Lecture:** Begin endogenous plant toxicants. (SB, Chap. 6)
- 10/20/21: **Lecture:** Endogenous plant toxicants (con't.).
- 10/22/21: **Lecture:** Endogenous plant toxicants (con't.); **Discussion:** Exam 2 review.

Week 10

- 10/25/21: **Exam 2:** 50 minutes, closed book.
- 10/27/21: **Lecture:** Pesticide residues and US regulations. (SB, Chap. 9)
- 10/29/21: **Lecture:** Processing-mediated food toxicants. (SB, Chap. 11)

Week 11

- 11/1/21: **Lecture:** Food additives and regulations. (SB, Chap. 10)
- 11/3/21: **Lecture:** Food toxicants and industrial waste/pollution (part 1) (SB, Chap 8); Begin Assignment 5; class decision on hot topics
- 11/5/21: **Lecture:** Industrial waste/geochemical contamination (part 2) – heavy metals;

Week 12

- 11/8/21: **Lecture:** Microbial (primarily bacterial) toxins and toxico-infections (Dr. K. Schneider).
- 11/10/21: **Lecture:** Microbial toxins (con't.); Assignment 5 due.
- 11/12/21: **Lecture:** Endocrine disruptor chemicals; BPA in food packaging.

Week 13

- 11/15/21: **Hot Topics Lecture (1):** Irradiation of foods or microplastics, for example
- 11/17/21: **Hot Topics Lecture (2):** Food-related GMOs and their regulation, for example
- 11/19/21: **Hot Topics Lecture (3):** nanotechnology or trans fats, for example

Week 14

- 11/22/21: **Lecture:** Food allergies and other clinically abnormal adverse reactions to foods; exam 3 material review
- 11/24/21: **UF Class Holiday – Thanksgiving;** no class
- 11/26/21: **UF Holiday – Thanksgiving;** no class

Week 15

- 11/29/21: **Exam 3:** 50 minutes, closed book
12/1/21: **Workday/Discussion:** What makes an interesting scientific presentation?
12/3/21: **Presentation/Discussion:** Begin peer presentations; Assignment 3 due (in draft final form with key supporting documents - everyone)

Week 16

- 12/6/21: **Presentation/Discussion:** Peer presentations
12/8/21: **Presentation/Discussion:** Peer presentations; Course summary and final exam review; Last day of class
12/10/21: **UF Reading Day;** no class

Week 17

- 12/16/21: **Final Exam (3:00-5:00pm; 2 hours; open book) – location TBD**

Information for All Students

Policy on In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor. A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session. Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student

Grades and Grade Points

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Attendance and Make-Up Work

Make-up work and exams will be arranged for official absences. 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/UGRD/academic-regulations/attendance-policies/>

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.

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/.

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general wellbeing 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 Counseling Services Groups and Workshops Outreach and Consultation Self-Help Library Wellness Coaching
- U Matter We Care, www.umatter.ufl.edu/.
- Career Connections Center, First Floor JWRU, 392-1601, <https://career.ufl.edu/>.

Student Complaints

- Residential Course: <https://sccr.dso.ufl.edu/policies/student-honor-code-studentconduct-code/>.
- Online Course: <http://www.distance.ufl.edu/student-complaint-process>.