FOS 6936 Food Toxicology (Topics in Food Science)
Section 22A1, 3 Credits, Fall 2017
Proposed Course Syllabus

Course Instructor and Office Hours

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Office Hours: Wednesday, 1-3pm; Thursday, 9-11am or 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), MCCA 2186

We will meet the first day of class (8/21/17).

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 occurance, 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://lss.at.ufl.edu/. We will use the Canvas site for archiving only; 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 and 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:

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

This text will be on reserve at the Marston Science Library under FOS 6936 and be available for purchase from the UF bookstores. The text will also be made available for use in Room 329, FSHN Building, where additional supplemental texts may also be reviewed for 2-hour periods.

Supplemental texts:

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)

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

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 (15 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

8/21/17: **Lecture:** Introduction to course; review of syllabus and course objectives; introduction and short history of toxicology. (CD, Chap. 1)

8/23/17: **Lecture:** Dose-response; interactions of toxic substances; classification of toxicants. (SB, Chap. 1; P, Chap. 1)

8/25/17: **Lecture:** Toxicology-related principles of cellular biology and biochemistry. (P, Chap. 1; general biochemistry texts)

Week 2

8/28/17: **Lecture:** Introduction to toxicokinetics.

8/30/17: **Lecture:** Routes of xenobiotics in organisms (entry, absorption, distribution). (SB, Chap. 1; CD, Chap. 5)

9/1/17: **Lecture:** Routes of xenobiotics in organisms (biotransformation). Begin Assignment 1.

Week 3

9/4/17: No class – UF holiday.
9/6/17: **Lecture:** Routes of xenobiotics in organisms (enzymes). (SB, Chap. 3)
9/8/17: **Lecture:** Routes of xenobiotics within organisms (excretion); Toxicokinetics – additional considerations and summary; Assignment 1 due.

Week 4

9/11/17: **Lecture:** Toxic response (other than carcinogenesis). (P, Chap. 3; SB, Chap. 2)
9/13/17: **Self-paced Lecture:** Toxic response: Introduction to carcinogenesis. (SB, Chap. 4); Begin Assignment 2.
9/15/17: **Self-paced Reading:** The influence of food and diet on carcinogenesis.

Week 5

9/18/17: **Lecture:** Toxic response - summary (SB, Chap. 4); Exam 1 discussion; Assignment 2 due.
9/20/17: **Exam 1:** 50 minutes, closed book.
9/22/17: **Lecture:** Analytical determination of toxic compounds. (SB, Chap. 2; P, Chap. 4); Begin Assignment 3 (scientific presentation).

Week 6

9/25/17: **Lecture:** Evaluation of toxicity of substances – toxicity testing (1). (SB, Chap. 2)
9/27/17: **Lecture:** Evaluation of toxicity of substances – toxicity testing (2). (SB, Chap. 2)
9/29/17: **Lecture:** Toxicity testing (3) and regulatory considerations. Begin Assignment 4.

Week 7

10/2/17: **Lecture:** Toxicological safety and risk analysis. (P, Chap. 6; CD, Chap. 4)
10/4/17: **Lecture/Discussion:** Risk analysis and public health policy (Dr. D. Archer, dlarcher@ufl.edu
10/6/17: **UF Holiday – Homecoming**; no class

Week 8

10/9/17: **Lecture:** Marine food toxins (Dr. K. Schneider, keiths29@ufl.edu). (SB, Chap. 5); Assignment 4 due.
10/11/17: **Lecture:** Animal endogenous toxins; veterinary drugs and prions (SB, Chap. 5)
10/13/17: **Lecture:** Mycotoxins. (SB, Chap. 7); Assignment 3 presentation topic approval due (email to instructor is fine).

Week 9

10/16/17: **Lecture:** Begin endogenous plant toxicants. (SB, Chap. 6)

10/18/17: **Lecture:** Endogenous plant toxicants (con't.).
10/20/17: **Lecture:** Endogenous plant toxicants (con't.) **Discussion:** Exam 2 review.

Week 10
10/23/17: **Exam 2:** 50 minutes, closed book.
10/25/17: **Lecture:** Pesticide residues and US regulations. (SB, Chap. 9)
10/27/17: **Lecture:** Processing-mediated food toxicants. (SB, Chap. 11)

Week 11
10/30/17: **Lecture:** Food additives and regulations. (SB, Chap. 10)
11/1/17: **Lecture:** Microbial (primarily bacterial) toxins and toxico-infections (Dr. K. Schneider). Begin Assignment 5.
11/3/17: **Lecture:** Microbial toxins (con't.).

Week 12
11/6/17: **Lecture:** Endocrine disruptor chemicals; BPA in food packaging.
11/8/17: **Lecture:** Food toxicants and industrial waste/pollution (part 1) (SB, Chap 8); Assignment 5 due; class decision on hot topics
11/10/17: **UF holiday – Veterans Day**; no class

Week 13
11/13/17: **Lecture:** Industrial waste/geochemical contamination (part 2) – heavy metals;
Begin Assignment 6.
11/15/17: **Hot Topics Lecture (1)**: Food-related GMOs and their regulation, for example
11/17/17: **Hot Topics Lecture (2):** nanotechnology or trans fats, for example

Week 14
11/20/17: **Hot Topics Lecture (3):** Irradiation of foods, for example
11/22/17: **UF Class Holiday – Thanksgiving**; no class
11/24/17: **UF Holiday – Thanksgiving**; no class

Week 15
11/27/17: **Lecture:** Food allergies and other clinically abnormal adverse reactions to foods; exam 3 material review
11/29/17: **Exam 3:** 50 minutes, closed book
12/1/17: **Presentation/Discussion:** Begin peer presentations; Assignment 3 due (in draft final form with key supporting documents - everyone)

Week 16
12/4/17: **Presentation/Discussion:** Peer presentations
12/6/17: **Presentation/Discussion:** Peer presentations; Course summary; Last day of class

12/8/17: **UF Reading Day**; no class

Week 17
12/13/17: Final Exam (3:00-5:00pm; 2 hours; open book) – location 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.

Use of Library, Personal References, PC Programs, and Electronic Data Bases:
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. If you're in the habit of underlining text, do it only on your personal copy. It is inconsiderate, costly to others, and dishonest to use common references otherwise.

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:
We hope to establish an effective and professional class relationship and encourage dialog so that students feel comfortable discussing academic problems directly with instructors. 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, 392-1171, 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.