

**FOS 6936 Food Toxicology (Topics in Food Science)
Section 07C8, 3 Credits, Fall 2013
Course Syllabus**

Course Instructors and Office Hours

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

Course Hours/Location

Official Time/Location (as listed in course schedules)

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

Actual Time/Location

- M, W, F Period 3 (9:35-10:25am), FSHN 362

We are conducting this course in the FSHN Conference Room (FSHN 362) location in to facilitate discussion commensurate with graduate level courses. We will email all registered students prior to the first day of class to confirm the meeting location for the first day of class (8/21/13).

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 instructors is to provide sufficient background and learning opportunity for the student to understand and discuss food toxicological issues competently as a scientist-citizen.

Prerequisites

Requirements include a B.S. degree in food science, human nutrition, 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.

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 Sakai by 8AM the day of each corresponding lecture: <https://lss.at.ufl.edu/>. We will use the Sakai site for archiving only; please use instructor's email for course correspondence (goodrich@ufl.edu), using "Food Toxicology" in the subject line.

Textbook and References

A note on readings:

Suggested 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.

Required 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.). 2008. Caserett and Doull's Toxicology, 7th Edition. McGraw-Hill. New York, NY. -- (CD)

Püssa, Tõnu. 2007. Principles of Food Toxicology. CRC Press, LLC. Boca Raton, FL. -- (P)

Watson, David. 1998. Natural Toxicants in Food. CRC Press, LLC. Boca Raton, FL.

Stine, K. and Brown, T. 1996. Principles of Toxicology. CRC Press, Inc. Boca Raton, FL.

Manahan, Stanley. 1992. Toxicological Chemistry, 2nd Edition. Lewis Publishers, Inc. Chelsea, MI.

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 term paper, in the form of a scientific review paper 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

8/21/13: **Lecture:** Introduction to course; review of syllabus and course objectives; introduction and short history of toxicology. (CD, Chap. 1)

8/23/13: **Lecture:** Dose-response; interactions of toxic substances; classification of toxicants. (SB, Chap. 1; P, Chap. 1)

Week 2

8/26/13: **Lecture:** Toxicology-related principles of cellular biology and biochemistry. (P, Chap. 1)

8/28/13: **Lecture:** Routes of xenobiotics in organisms (entry, absorption, distribution). (SB, Chap. 1; CD, Chap. 5)

8/30/13: **Lecture:** Routes of xenobiotics in organisms (biotransformation). Assignment 1 handed out.

Week 3

9/2/13: No class – UF holiday.

9/4/13: **Lecture:** Routes of xenobiotics in organisms (enzymes). (SB, Chap. 3)

9/6/13: **Lecture:** Routes of xenobiotics within organisms (excretion); Assignment 1 due.

Week 4

9/9/13: **Lecture:** Toxicokinetics – additional considerations and summary; Assignment 2 handed out.

- 9/11/13: **Lecture:** Toxicant biomagnification, environmental pollution and environmental concerns for foodstuffs (SB Chap. 8)
- 9/13/13: **Lecture:** Toxic response (not including carcinogenesis). (P, Chap. 3; SB, Chap. 2)

Week 5

- 9/16/13: **Lecture:** Toxic response - carcinogenesis (SB, Chap. 4); Assignment 2 due. Exam 1 cut-off.
- 9/18/13: **Discussion and Study Session:** Review for Exam 1 (Dr. L. Delva, lemanedelva@ufl.edu).
- 9/20/13: **Exam 1:** 50 minutes, closed book.

Week 6

- 9/23/13: **Lecture:** Analytical determination of toxic compounds. (SB, Chap. 2; P, Chap. 4); Assignment 3 handed out (review paper).
- 9/25/13: **Lecture:** Evaluation of toxicity of substances – toxicity testing. (SB, Chap. 2)
- 9/27/13: **Lecture:** Toxicity testing (con't.) and regulatory considerations. Begin Assignment 4.

Week 7

- 9/30/13: **Lecture:** Animal endogenous toxins; veterinary drugs and prions (SB, Chap. 5)
- 10/2/13: **Lecture:** Marine food toxins (Dr. K. Schneider, keiths29@ufl.edu). (SB, Chap. 5)
- 10/4/13: **Lecture:** Endogenous plant toxicants. (SB, Chap. 6). Assignment 4 due.

Week 8

- 10/7/13 **Lecture:** Endogenous plant toxicants (con't.). Assignment 3 paper topic approval due (email to instructor is fine). Begin Assignment 5.
- 10/9/13: **Lecture:** Toxicological safety and risk analysis. (P, Chap. 6; CD, Chap. 4)
- 10/11/13: **Lecture/Discussion:** Risk analysis and public health policy (Dr. D. Archer, dlarcher@ufl.edu). Exam 2 cut-off.

Week 9

- 10/14/13: **Mini-lecture:** Research and review papers, and presenting scientific data to scientists and the lay public. **Discussion:** Exam 2 review and study session. Assignment 5 due.
- 10/16/13: **Exam 2:** 50 minutes, closed book.
- 10/18/13: **Lecture:** Mushroom toxins and mycotoxins. (SB, Chap. 7)

Week 10

- 10/21/13: **Lecture:** Mycotoxins (con't.)
- 10/23/13: **Lecture:** Alcohol toxicity and regulation of alcoholic beverages in the US. (CD, Chap. 24)
- 10/25/13: **Lecture:** Pesticide residues and US regulations. (SB, Chap. 9)

Week 11

- 10/28/13: **Lecture:** Endocrine disruptor chemicals. (S, Chap. 9)
10/30/13: **Lecture:** Microbial (primarily bacterial) toxins and toxico-infections (Dr. K. Schneider). Begin Assignment 6.
11/1/13: **Lecture:** Processing-mediated food toxins (SB, Chap. 11)

Week 12

- 11/4/13: **Lecture:** Processing-mediated food toxins (con't.).
11/6/13: **Lecture:** Food additives. (SB, Chap. 10). Assignment 6 due.
11/8/13: No class – UF holiday

Week 13

- 11/11/13: No class – UF holiday
11/13/13: **Lecture:** Food additives and regulations (con't.).
11/15/13: **Lecture:** Hot topics in food toxicology – irradiation, GMOs, etc. Begin Assignment 7.

Week 14

- 11/18/13: **Lecture:** Hot topics in food toxicology (con't.)
11/20/13: **Lecture:** Lipids, oxidants and anti-oxidants. Draft of paper due (optional); I will hand back on 11/26/13 with comments for final revision for papers I receive by 5PM today. Cut-off for Exam 3.
11/22/13: **Discussion:** Exam 3 review. Assignment 7 due.

Week 15

- 11/25/13: **Exam 3:** 50 minutes, closed book.
11/26/13: Paper drafts handed back final revising.
11/27/13: No class – UF holiday.
11/29/13: No class – UF holiday.

Week 16

- 12/2/13: **Lecture:** Food Factors and Health – The Issue of Functional Foods. (SB, Chap. 12).
12/4/13: **Lecture:** Course summary; Last day of class;
12/6/13: Fall semester reading day; Review paper (Assignment 3) due.

Week 17

- 12/12/13: **Final Exam (10am; 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.