Toxicology 429/529: Toxic Substances in Food

3 Credits
Tuesday, Thursday 4:00-5:20
Weniger 201
Recommended Pre-Requisites: Biochemistry 350, 450, or 490

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Office hours:  Wednesdays, 12-1, and by appointment

Instructional Objectives and Student Learning Outcomes of the Course:
Undergraduate students:
To present upper division undergraduate students with an in-depth analysis of the
toxicology of human exposure to natural and synthetic toxicants that may be found in
food. At the completion of this course, the student will be able to:
1. Understand key terms and concepts relating to epidemiological studies involving
human exposure to natural and synthetic chemicals that may be found in food.
2. Demonstrate an understanding of risk assessment principles and the regulation of
toxic substances in foods.
3. Demonstrate knowledge of exposure pathways, toxicological mechanisms, and
health effects associated with food toxicants.

Graduate students:
To present graduate students of scientific disciplines with an in-depth analysis of the
toxicology and epidemiology of human exposure to natural and synthetic toxicants that
may be found in food. At the completion of this course, the student will be able to:
1. Critically analyze scientific literature on the regulation, epidemiology, and
toxicology of human exposure to toxic substances in foods.
2. Evaluate the strengths and limitations of existing methods of safety and toxicology
assessment for toxic substances in foods.
3. Synthesize approaches towards investigating human health problems associated
with toxic substances in foods.

Assessment/Evaluation of Student Performance:
Undergraduate students: Demonstrated achievement will be measured by a course grade
(A-F), which will be determined by performance on problem sets (35%), a midterm
(30%), and comprehensive final examination (35%).

Graduate students: Demonstrated achievement will be measured by a course grade (A-F),
which will be determined by performance on problem sets (35%), a midterm (30%),
and comprehensive final examination (35%). Additional problem sets will be assigned to
graduate students, and will emphasize written analyses, critical evaluation of key concepts, and synthesis and communication of scientific approaches towards studying human health problems associated with toxic substances in foods. Graduate student performance on the midterm and final examination will be evaluated separately and at a higher standard than undergraduate students.

**Code of Conduct:**

This course will address issues relating to foods, science, and the environment. As individuals have diverse views towards these themes, it is most important that all course participants communicate with each other and the instructor in a civil and respectful manner. Open discussion about course topics is actively encouraged, with an understanding that all perspectives are to be welcomed and respected. Students are expected to be honest and ethical in their academic work. For further information about academic integrity and the University's policies and procedures in this area, please visit the Student Conduct web site at: [http://www.orst.edu/admin/stucon/achon.htm](http://www.orst.edu/admin/stucon/achon.htm)

**Students with Disabilities:**

Accommodations are collaborative efforts between students, faculty and Disability Access Services (DAS). Students with accommodations approved through DAS are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through DAS should contact DAS immediately at 737-4098.

**Recommended course readings:**

The recommended text for this course is *Food and Nutritional Toxicology*, by Stanley T. Omaye. CRC Press, 2004. The text is available for purchase from the OSU bookstore, and 2 copies are being held on reserve at the OSU library. Call Number VR 27.

**Additional course readings:**

Any additional required or recommended readings will be designated in the Reading Schedule and posted on the course website, on Blackboard.

**Problem sets:**

Each lecture will include a set of questions based upon the lecture material. These are accessible from the “Assignments” folder on Blackboard.

**Lecture schedule (number):**

1. September 25, 2007: Epidemiology (terms, principles, study design)
2. September 27, 2007: Toxicology (fundamentals)
3. October 2, 2007: Toxicokinetics, Toxicodynamics
4. October 4, 2007: Food and Regulatory Toxicology
5. October 9, 2007: Mycotoxins I (ergot, trichothecenes)
6. October 11, 2007: Mycotoxins II (aflatoxins)
7. October 16, 2007: Bacterial toxins
8. October 18, 2007: Marine toxins
   October 25, 2007: **Midterm examination**
10. October 30, 2007: Mercury and methylmercury
11. November 1, 2007: Metals II: Arsenic, lead
12. November 6, 2007: Persistent Organochlorines (DDT, Dioxins, PCB’s)
14. November 13, 2007: Modern Insecticides II
15. November 15, 2007: Heterocyclic Amines, PAH’s
   November 22, 2007: **Thanksgiving Holiday**
17. November 27, 2007: Biotechnology and Plant-Incorporated Protectants
18. November 29, 2007: Review session
   TBA          **Final examination**