

Food Toxicology – FS 464/564 (3 cr) Fall 2024 (v.8/16/24)

Lectures: Online – Scheduled Twice Weekly on Tuesdays and Thursdays

Prerequisites for class: Required: MMBB 300 or 380 (Biochemistry)

Recommended: Biol. 100 or 201, Chem 111, 113, 275

Instructor(s): Greg Möller

Office Location: 204a Food Research Center

Telephone: 208-885-0401 or personal cell phone

E-mail: gmoller@uidaho.edu

Delivery: Over Internet via streaming video/audio. Video/Audio Podcast via direct download. Students are required to have modern computer hardware and software, and access to a broadband internet connection. Specific requirements are given on the course web site. Lectures are available by streaming video on a two-lecture module per week schedule. Office hours are by arrangement with the instructor via email at gmoller@uidaho.edu. Phone/text contact via personal cell phone # given to enrolled students. Both on-campus and off-campus students will view formal lectures over the Web. Lectures are available by streaming video Webcast. Webcast lecture videos are available at www.webpages.uidaho.edu/foodtox. Students can view lectures anytime over the Web as your schedule and location permit. Because of the nature of the course, no formal office hours are scheduled; however, I can meet with you online, by phone, by text, or on campus most anytime you wish – please contact me with any questions or concern you may have. Email/phone contact (off/on-campus) or office appointments (on-campus) are welcome.

Textbooks:

1. Essentials of Environmental Toxicology, W.W. Hughes (E-book available from online booksellers).
2. Introduction to Food Toxicology (Second edition, 2009), T. Shibamoto, L. F. Bjeldanes (Available from online booksellers).

Online Course Web Site and Learning Management System:

Course Web Site: <http://www.webpages.uidaho.edu/foodtox>

Canvas: [Canvas](#) LMS for lecture homework and exams (linked via course website for enrolled student login).

Course Abstract: Food toxicology is the study of the nature, properties, effects, and detection of toxic substances in food or food animal feed and their disease manifestation in humans. This course will provide a general review of toxicology related to food and the human food chain. Fundamental concepts will be covered including dose-response relationships, absorption of toxicants, distribution and storage of toxicants, biotransformation and elimination of toxicants, target organ toxicity, teratogenesis, mutagenesis, carcinogenesis, food allergy, and risk assessment. The course will examine chemicals of food interest, such as food additives, natural products, mycotoxins, and pesticides, and how they are tested and regulated. We will critically review case studies and special topics.

Student Learning Outcomes: Upon successful completion of this course, students will

1. be able to demonstrate a fundamental knowledge of processes and endpoints in the human body associated with exposure to toxic agents in the human food chain;
2. be able to demonstrate a fundamental knowledge of risk assessment and food safety as it is applied to toxic agents in the human food chain;
3. acquire mastery with the major issues, concepts, and subject areas in food toxicology;
4. acquire mastery of sourcing and synthesizing information in aspects of Food Chemistry, Toxicology and Microbiology as it applies to chemical food safety and food toxicology;
5. be able to demonstrate sufficient knowledge about the occurrence and significance of major food-borne toxicants and be able to apply that knowledge for advanced analysis in the context of the food system, regulatory science, and public communication.

Week-to-Week Course Outline: There are two lectures per week and each Web lecture module can have a assigned homework question set that is available in Canvas. Lectures are 35-70 minutes via streaming video. Downloadable lecture companion slide sets are 35-65 slides.

Class Lecture Schedule:

T 8/20	Introduction to Food Toxicology
Th 8/22	History of US Food Regulation
T 8/27	Concepts of Toxicology
Th 8/29	Pesticide Residues in Food
T 9/3	Dose-Response Relationships
Th 9/5	Absorption of Toxicants
T 9/10	Distribution and Storage of Toxicants
Th 9/12	Biotransformation and Elimination of Toxicants
T 9/17	Target Organ Toxicity
Th 9/19	Teratogenesis, Mutagenesis, and Carcinogenesis
T 9/24	Food Allergy
Th 9/26	Food Intolerance and Metabolic Disorders
T 10/1	Midterm Exam I
Th 10/3	Food Additive Safety Assessment
T 10/8	Toxicology of Selected Food Additives
Th 10/10	Genetically Modified Organisms in Food
T 10/15	Food Irradiation
Th 10/17	Natural Toxins in Plants and Fungi: The Ecological Biochemistry of Food
T 10/22	Toxic Mold and Mycotoxins
Th 10/24	Marine Toxins in Food
T 10/29	Naturally Occurring Toxicants as Etiologic Agents of Food-borne Disease
Th 10/31	Bacterial Toxigenesis
T 11/5	Animal Drug Residues in Food
Th 11/7	Toxicants Formed During Food Processing
T 11/12	Midterm Exam II
Th 11/14	Dioxin and Related Compounds in the Human Food Chain
T 11/19	Human Health Risk Assessment of Lead and Arsenic
Th 11/21	Mercury in the Human Food Chain
T 11/28	<i>Thanksgiving break (no class)</i>
Th 11/29	<i>Thanksgiving break (no class)</i>
T 12/3	Frontiers of Food Toxicology
Th 12/5	Self-Study and Final Exam Open Period (timed, opens online)



Course Accessibility: Food Toxicology has been designed towards best practices for access by people with or without disabilities. Enrolled students in Food Toxicology can request transcripts of lectures by emailing gmoller@uidaho.edu. Please contact the instructor for support in accessing course materials.

Readings: As assigned on course Web site. Each lecture has reading assignments that will average 1 hour each.

Homework: As assigned on course Web site. Delivered online via *FoodTox* Canvas site. Each lecture module has an online homework submission that will take approximately 30 minutes typically worth 20 pts. Each lecture has a short discussion prompt worth 5 pts each.

Homework Projected Percent of Effort:**464 Homework**

50% Case study report

50% (total) Lecture homework & discussion

564 Homework

40% Case study report

30% (Total) Lecture homework & discussion

30% Topic review

Examinations: All examinations are electronically delivered and electronically returned. The exams are individual effort, take home, and open book, open web. Midterms are ½ multiple choice and ½ problems. The final exam is multiple choice. The take-home exams will take 4-12 hours to complete, depending on the individual student.

Case Study Report: All students will be required to prepare a case study report (*Please target 4000 words; maximum total of 20 pages, double-spaced; 1-inch margins; 12 pt font; 12 references minimum*). Your case study will examine a chemical food toxicology concern. The case study will examine sources, pathways, receptors, and controls for your target chemical in the human food chain and human disease manifestation. Your paper will be submitted according to the required format and will reference major peer-reviewed work and reviews. You will review major sources of the chemical, natural or synthetic, fate and transport in the food system, toxicomechanics, toxicodynamics, toxicological endpoints in animals or humans, and the natural, engineered, or regulatory controls that aid in the mitigation of the exposure. **The full case study paper is due 11/15.** Additional information is presented in the Resources section of the course website. You are welcome to contact the instructor online, by telephone, or in-person for an interview to discuss the outline, scope, and progress of this paper. The file name for your paper submitted by email to the instructor will be in the format: "Lastname.Firstname_Casestudy_FoodtoxF24.doc"

Graduate Credit Topic Review: Students taking the course for graduate credit will be required to write a **new science** review paper using one of the lecture titles of the *Food Toxicology* course. The paper will be reviewed for completeness, scientific accuracy, and presentation (readability, grammar, and spelling). The paper should review the major technical issues and contain a bibliography of published papers. The paper should attempt to **update** the material and/or conclusions presented in the lecture with a review of current information found from the scientific literature (15 or more references), scholarly publications (books), and online information from reliable sources (typically government or scientific society). **Nearly all your references should have been published in the last five years.** The word count target for the body of this paper is 4000 words. **The completed review is to be submitted no later than 12/7.** Additional information is presented in the Resources section of the course web site. The standard of writing is that of professional publication. You are welcome to contact the instructor online, by telephone, or in-person for an interview to discuss the outline, scope, and progress of this paper. The file name for your paper submitted by email to the instructor will be in the format: "Lastname.Firstname_TopicReview_FoodtoxF24.doc"

It is your responsibility to understand what plagiarism is and how to avoid it. Any paper with sections that are either entirely or partly copied, is copied word-for-word, or is rephrased by changing words in a sentence (or from another student's or author's work) is not acceptable. These are instances of plagiarism, which is a very serious academic offense that involves stealing another person's thoughts. Your writing will be compared electronically with millions of data-based documents and examined for copied phrases and for sentence structure rearrangements. Copying phrases or rearranging an author's sentence structure is considered plagiarism, which is a very serious academic offense with the consequences outlined in the syllabus. If you are unfamiliar with the definition and examples of plagiarism, or the guidelines for avoiding plagiarism please refer to the course syllabus and the wealth of quality plagiarism guidelines searchable on the WWW. If you use AI, please use it as an assistant only. This is your course and your development of critical thinking skills. Copy/paste of AI generated content is considered plagiarism.

*****IMPORTANT: All papers submitted will be electronically scanned for evidence of plagiarism or ghostwriting. Evidence of plagiarism or ghostwriting (AI or otherwise) will result in an automatic grade of zero for the submitted work, and in severe cases carries the potential for university academic dishonesty review and sanction according to university policies (see below).**

Grading Breakdown:

	<u>464 Students</u>	<u>564 Students</u>
Homework & discussion	25%	20%
Exams #1 and #2	25%	20%
Final Exam	20%	15%
Case Study Report	30%	25%
Topic Review	Not required	20%

Grade Distribution: The grade scale applied each semester may be curved depending on class achievement (*e.g.*, an A grade may be earned with 89% as opposed to 90%). Students enrolled in 436 or 536 are in different final course grade distribution pools so the extent of grade curving could be different.

<u>Grade Scale</u>	
>90%	A
80-89%	B
70-79%	C
60-69%	D
≤59%	F

Relationship of Grading Strategy and Student Learning Outcomes:

1. Homework will require an understanding of lecture material and reading assignments.
2. Exams will require students to demonstrate mastery of course material and synthesize available information into practical demonstrations of food toxicology concepts.
3. Course papers will require the student to demonstrate their subject matter mastery, communication skill, and ability to obtain primary sources of best available information in an applied science interpretative challenge.
4. Grading rubrics for written papers will be available to students to link subjective assessment targets with student work submission.

Course Honor Code: Terms and conditions for students taking this course (FS 464/564). By enrolling in this course, you agree to the following terms and conditions:

1. I will not use or represent the work of another as my own. This specifically includes the use of other students' work, WWW resources, and published works. I understand that attribution of source is encouraged and a part of the ethical practice of science and learning.
2. I will abide by the instructions on exams, tests, quizzes and homework assignments when they are labeled or assigned as closed book, individual effort or other such designation of assistance or period of performance. I further understand that it is my ethical duty, on my honor, that I abide by these instructions even in the absence of an instructor or exam proctor.

Campus Resources: [UI Library](#); [UI Writing Center](#)

Disability Support Services Reasonable Accommodations Statement:

CENTER FOR DISABILITY ACCESS AND RESOURCES REASONABLE ACCOMMODATIONS STATEMENT:

The University of Idaho is committed to ensuring an accessible learning environment where course or instructional content are usable by all students and faculty. If you believe that you require disability-related academic adjustments for this class (including pregnancy-related disabilities), please contact the Center for Disability Access and Resources (CDAR) to discuss eligibility. A current accommodation letter from CDAR is required before any modifications, above and beyond what is otherwise available for all other students in this class, will be provided. Please be advised that disability-related academic adjustments are not retroactive. CDAR is located at the Bruce Pitman Building, Suite 127. Phone is 208-885-6307 and email is cdar@uidaho.edu. For a listing of services and current business hours visit uidaho.edu/cdar.

UI Academic Integrity:

A-1. Academic Dishonesty. Academic honesty and integrity are core values at a university and the faculty finds that even one incident of academic dishonesty may merit expulsion. Instructors and students are jointly responsible for maintaining academic standards and integrity in university courses. In addition to any disciplinary

sanctions imposed under the Code, additional consequences for academic dishonesty may be imposed by the course instructor, including issuing a grade of “F” in the course. Any grade issued by the course instructor, whether as a result of academic dishonesty or not, constitutes an academic evaluation and is not disciplinary action. All instructors must report incidents of academic dishonesty to DOS by email or using the reporting form on DOS website. Acts of academic dishonesty include but are not limited to the following:

a. Cheating includes, but is not limited to, the following:

- (1) using any unauthorized assistance in, or having unauthorized materials while, taking quizzes, tests, examinations or other assignments, including copying from another’s quiz, test, examination, or other assignment or allowing another to copy from one’s own quiz, test, examination, or other assignment;
- (2) using sources beyond those authorized by the instructor in writing papers, preparing reports, solving problems, or carrying out other assignments;
- (3) acquiring, without permission, tests or other academic material belonging to the instructor or another member of the University faculty or staff;
- (4) engaging in any behavior prohibited by the instructor in the course syllabus or in class discussion; or
- (5) engaging in other behavior that a reasonable person would consider to be cheating.

b. Plagiarism includes, but is not limited to, the following:

- (1) using, by paraphrase or direct quotation, the published or unpublished work of another person without full and clear acknowledgment;
- (2) using materials prepared by another person or agency engaged in the selling of term papers or other academic materials without prior authorization by the instructor; or
- (3) engaging in other behavior that a reasonable person would consider plagiarism.

Plagiarism is dishonest and is not tolerated. If caught using all or portions of a current or former classmate’s writing or other sources of information, a grade of “zero” will be given for the exercise. Additional penalties for plagiarism are possible as outlined in the University of Idaho and/or Washington State University Student Handbook.

Student Resources

The University of Idaho provides student support to ensure a successful learning experience.

- [Uofl Student Resources](#)
- [SI-PASS \(Peer Assisted Study Sessions\)](#)
SI-PASS provides regularly scheduled, peer-led study sessions for difficult courses.

Library Help

The Uofl Library website has many databases that will help you find relevant and reliable books, articles, images, and more. Don't hesitate to contact a librarian for research assistance.

- [Uofl Library Website](#)

- [Help - Reference Services](#)
- [Help for Distance Ed Students](#)

Technology Help

The UofI Student Technology Center provides many technology related services to students.

- PHONE: 208-885-HELP (208-885-4357)
- [Technology Help Email](#)
- [Technology Help Website](#)

Writing Support

The UofI Writing Center provides one-on-one assistance to student writers and other members of the campus community.

- PHONE: 208-885-6644
- [Writing Center Email](#)
- [Writing Center Website](#)

Healthy Vandals Policies

Please visit the [University of Idaho COVID-19 webpage](#) often for the most up-to-date information about the UofI's response to Covid-19.

Course Sustainability Statement: With the possible exception of the textbook, this course is designed to be electronically available, and paper-free. Exams, homework, and students' papers are all distributed and returned electronically. Think first about printing, and please only print course material if it is necessary.