

## Principles of Environmental Toxicology – FS 409/509 (3 cr)

### Lectures: Online – Scheduled Twice Weekly on Tuesdays and Thursdays

**Prerequisites:** Recommended: Biol 102 or Biol 115, Chem 111, Chem 112, Chem 275, and Stat 251 or WSU equivalent

**Instructor(s):** Professor 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 Web cast (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 or downloadable podcast on a two lecture module per week schedule. Office hours are by arrangement with the instructor via email at [gmoller@uidaho.edu](mailto:gmoller@uidaho.edu) Phone/text contact via personal cell phone # given to enrolled students. We will occasionally use Skype and/or other VOIP clients; Individual and small (<6) group voice conferencing available (via Skype or Google+ ). Both on-campus and off-campus students will view formal lectures over the Web. Lectures are available by streaming video Webcast from the course website. Webcast lecture videos are available at [www.agls.uidaho.edu/etox](http://www.agls.uidaho.edu/etox) . 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 in my office almost 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.

#### **Textbook:**

Principles and Practice of Toxicology in Public Health, by Ira S. Richards; ISBN-13: 9780763738235; ISBN-10: 0763738239; Paperback, ©2008, 464 Pages (*available via online booksellers*)

#### **Online Course Web Site and Learning Management System:**

**Course Web Site:** <http://www.agls.uidaho.edu/etox>

**Blackboard:** UI Blackboard (or WSU Angel) LMS for lecture homework and exams (linked via course website for enrolled student log-in).

#### **Course Abstract:**

Environmental toxicology is the study of the nature, properties, effects and detection of toxic substances in the environment and in any environmentally exposed species, including humans. This course will provide a general understanding of toxicology related to the environment. Fundamental toxicological concepts will be covered including dose-response relationships, absorption of toxicants, distribution and storage of toxicants, biotransformation and elimination of toxicants, target organ toxicity and teratogenesis, mutagenesis, carcinogenesis and risk assessment. The course will include an overview of chemodynamics of contaminants in the environment including fate and transport. The course will examine chemicals of environmental interest and how they are tested and regulated. Case studies and special topics will be critically reviewed.

**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;
2. be able to demonstrate a fundamental knowledge of risk assessment and risk management as it is applied to toxic agents in the environment;
3. acquire mastery with the major issues, concepts, and subject areas in environmental toxicology;
4. acquire mastery of sourcing and synthesizing information in the major aspects of Environmental Toxicology and Chemistry;
5. be able to demonstrate sufficient knowledge about the occurrence and significance of major environmental toxicants and be able to apply that knowledge for advanced analysis in the context of the environmental quality, public health, sustainability, 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 Blackboard. Lectures are 35-70 minutes via streaming video. Downloadable lecture companion slide sets are 35-65 slides (save a tree-please do not print).

**Class Lecture Schedule:**

T 8/21	Introduction to Environmental Toxicology
Th 8/23	“Silent Spring”
T 8/28	Concepts of Toxicology
Th 8/30	Special Topics: Pesticide Residues
T 9/4	Dose-Response Relationships
Th 9/6	Absorption of Toxicants
T 9/11	Distribution and Storage of Toxicants
Th 9/13	Biotransformation and Elimination of Toxicants
T 9/18	Target Organ Toxicity
Th 9/20	Teratogenesis, Mutagenesis, and Carcinogenesis
T 9/25	Special Topics: Dioxins and Related Compounds
Th 9/27	<b>Midterm Exam I</b>
T 10/2	Risk Assessment I
Th 10/4	Risk assessment II
T 10/9	Case Studies: 1) Selenium Ecotoxicology 2) Arsenic in Drinking Water
Th 10/11	Ecological Biochemistry
T 10/16	Abiotic Transformation in the Environment
Th 10/18	Environmental Chemodynamics
T 10/23	Environmental Transport
Th 10/25	Environmental Chemicals I: heavy metals and metalloids; nutrients; radionuclides
T 10/30	Environmental chemicals II: heavy metals and metalloids; nutrients; radionuclides
Th 11/1	Environmental chemicals III: industrial chemicals, pesticides, petrochemicals, biotoxins
T 11/6	Environmental chemicals IV: industrial chemicals, pesticides, petrochemicals, biotoxins
Th 11/8	Special Topic: Endocrine Disruption
T 11/13	<b>Midterm Exam II</b>
Th 11/15	Special Topic: Dioxin and Related Compounds
T 11/20	<i>Thanksgiving break (no class)</i>
Th 11/22	<i>Thanksgiving break (no class)</i>
T 11/27	Monitoring Chemicals in the Environment
Th 11/29	Regulating Chemicals in the Environment: RCRA, CERCLA, CWA, CAA, FIFRA
T 12/4	Frontiers of Environmental Toxicology
Th 12/6	Course Review
T 12/11	<b>Final Exam</b>



**Course Accessibility:** Principles of Environmental Toxicology has been designed towards best practices for access by people with or without disabilities. Enrolled students can request transcripts of lectures by emailing [gmoller@uidaho.edu](mailto: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 UI *ETox* Blackboard site (or WSU Angel). Each lecture module has an online homework submission and discussion that will take approximately 30 minutes to 1 hour.

**Homework Projected Percent of Effort:****409 Homework**

50% Case study report

50% (total) Lecture homework &amp; discussion

**509 Homework**

40% Case study report

30% (total) Lecture homework &amp; discussion

30% Book review project

**Examinations:**

All examinations are electronically delivered and electronically returned. The exams are individual effort, take home, and open book. Midterms are ½ multiple choice and ½ problems. The final exam is multiple choice. The open book, open web, individual effort midterm 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 (*maximum total of 20 pages, double spaced; 1 inch margins; 12 pt font; 12 references minimum*). Your case study will examine a chemical in a specific contaminated site or media. The case study will examine sources, pathways, receptors and controls for your target chemical(s) in the target environment. Your paper will be submitted according to a required format and will reference major peer-reviewed work and reviews. You will review major sources of the chemical - natural or manmade, fate and transport in the environment, toxicological endpoints in animals or humans and what environmental (natural or engineered) or regulatory controls aid in the mitigation of the exposure. The full paper is due on or before 11/25. A grading rubric for performance expectations will be available. Additional information is presented in the Resources section of the course web site. This work product is the most important in the course for demonstrating your mastery of the material.

**Graduate Credit Book Review:**

Students taking the course for graduate credit will be required to perform a **critical** book review for a book from a recommended list found on the course Web site or a book submitted for instructor approval. The books are focused, in-depth analyses of subjects such as endocrine disruption, risk analysis, pesticide use or specific chemicals. There is an option to submit a proposal for your own book selection. The report will be reviewed for completeness, scientific accuracy, and presentation (readability, grammar, and spelling). The report should review the technical issues of the book and examine the presentation for bias and completeness. The review should reflect your scientifically defensible, critical opinion of the thesis of the book. The report should attempt to update the material and/or conclusions presented in the book with a review of current information found from reliable sources such as the scientific literature (5 or more references). *The max length for this double spaced (1 inch margins; 12 pt font) report is 15 pages (fully inclusive)*. 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 expected standard of writing is that of professional publication. At least one online, telephone, or in-person instructor-graduate student interview will be scheduled to discuss the outline, scope, and progress of this paper.

***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.

**\*\*\*IMPORTANT: All papers submitted will be electronically scanned for evidence of plagiarism. Evidence of plagiarism 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>409 Students</u>	<u>509 Students</u>
Homework & discussion	25%	20%
Exams #1 and #2	25%	20%
Final Exam	20%	15%
Case Study Report	30%	25%
Book 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 409 or 509 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.

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

**Disability Support Services Reasonable Accommodations Statement:**

UI: Reasonable accommodations are available for students who have documented temporary or permanent disabilities. All accommodations must be approved through Disability Support Services located in the Idaho Commons Building, Room 306 in order to notify your instructor(s) as soon as possible regarding accommodation(s) needed for the course.

- 208-885-6307
- email at <dss@uidaho.edu>
- website at <www.access.uidaho.edu>

Students should present a completed and signed Accommodation Checklist for the current semester from Disability Support Services when requesting accommodations. Students should not present the checklist before or after class, if they do, request that they see you during your office hours. If they do not have a current checklist both completed and signed, please refer them to the Disability Support Services office (Idaho Commons, Room 306) to obtain one. If you have any questions regarding a student(s) with a disability(s), or how to best work with a particular student in class, please contact our office.

WSU: Reasonable accommodations are available for students with a documented disability. WSU Online and the Access Center work together to provide reasonable accommodations for students who have documented disabilities and who are registered both with WSU Online and the Access Center. WSU Online's liaison to the Access Center will assist you in getting started. To begin this process, contact WSU Online (800-222-4978 or [distance@wsu.edu](mailto:distance@wsu.edu)). We strongly recommend that you notify us as soon as possible. All accommodations must be approved through the Access Center.

**Course Honor Code:**

Terms and conditions for students taking this course (EnvS/FS 436/536). 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.

**UI Academic Integrity:**

University of Idaho, Faculty Staff Handbook: ARTICLE II--ACADEMIC HONESTY. *[section renumbered 8-07]*

1. Cheating on classroom or outside assignments, examinations, or tests is a violation of this code.
2. Plagiarism, falsification of academic records, and the acquisition or use of test materials without faculty authorization are considered forms of academic dishonesty and, as such, are violations of this code.
3. Because academic honesty and integrity are core values at a university, the faculty finds that even one incident of academic dishonesty seriously and critically endangers the essential operation of the university and may merit expulsion. *[rev. 7-98]*
4. The operation of UI requires the accuracy and protection of its records and documents. To use, make, forge, print, reproduce, copy, alter, remove, or destroy any record, document, or identification used or maintained by UI violates this code when done with intent to defraud or misinform.
5. All data acquired through participation in UI research programs is the property of the university and must be provided to the principal investigator. In addition, collaboration with the University Research Office for the assignment of rights, title, and interest in patentable inventions resulting from the research is also required [see 5400 A through E].
6. Entrance without proper authority into any private office or space of a member of the faculty, staff, or student body is a violation of this code.
7. It is also a violation to hack or make unauthorized use of any computer or information system maintained by the university or a member of the faculty, staff, or student body. *[rev.7-05]*
8. Instructors and students are responsible for maintaining academic standards and integrity in their classes. Consequences for academic dishonesty may be imposed by the course instructor. Such consequences may include but cannot exceed a grade of "F" in the course. The instructor should attempt to notify the student of the suspected academic dishonesty and give the student an opportunity to respond. The notice and the opportunity may be informal and need not be in writing. Penalties for any disciplinary infraction must be judicially imposed. [See 1640.02 C-5] *[rev. 7-98]*
9. Instructors may report incidents of academic dishonesty to the dean of students. Upon receiving such a report, the dean of students shall provide the student with written notice that a report has been made and an opportunity to meet with the dean to discuss the report. The dean of students shall maintain the report and any record of the meeting for a period of time deemed appropriate by the dean. The dean of students may file a complaint against the student after the meeting has taken place or the student has elected, either affirmatively or through inaction, not to meet with the dean. *[add. 7-98]*

**WSU Academic Integrity:**

WSU expects all students to behave in a manner consistent with its high standards of scholarship and conduct. Students are expected to uphold these standards both on and off campus and acknowledge the university's authority to take disciplinary action. The purpose of these standards and processes is to educate students and protect the welfare of the community. The standards of Conduct for Students can be found at <http://conduct.wsu.edu> University instructors have the authority to intervene in all situations where students are

suspected of academic dishonesty. In such instances, responsible instructors retain the authority to assign grades to students considering, from an academic standpoint, the nature of the student action. More information regarding responding to academic integrity violations can be found at <http://conduct.wsu.edu>. Feel free to contact the Office of Student Standards and Accountability (335-4532) if you would like more specific information about the process. Writing Programs (335-7959) can assist with proactive assignment design that minimizes intentional or unintentional academic dishonesty.

### **Plagiarism:**

Plagiarism is defined by Webster's Dictionary as, "*to steal and pass off the ideas or words of another as one's own.*" There are two general forms of plagiarism:

(a) Unintentional: the use of other writers' words, phrases, sentences, paragraphs as though they were your own *without understanding* the need to cite the original source. Unintentional plagiarism normally occurs when the individual does not understand the conventions of scientific writing and the need to cite sources of information.

(b) Intentional: the use of other writers' work and claiming it as your own. Intentional plagiarism includes *knowingly copying* or incorporating sections of books, articles, or other sources into your work without citation.

To avoid plagiarism, you must acknowledge the source of information. In scientific writing, this can be performed in the text of your work through the use of surnames of authors and the year of publication or by using numbers enclosed by parentheses which correspond to specific citations in the reference section. In addition to employing citations in the text, plagiarism can be avoided by applying special techniques when writing about information obtained from a source:

(a) Paraphrase: rewording information in which you accurately present the main ideas from the source but do so using your own organization, words, and sentence structures.

(b) Summary: a concise statement of the main idea from a section within a source.

(c) Direct quotation: use of quotes surrounding the passage written by another author.

In general, paraphrasing (a) and the use of summary statements (b) are very common techniques used in scientific writing. Use of quotations (c) in scientific writing is rare and should be avoided.

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*.

### **Safety:**

Washington State University is committed to maintaining a safe environment for its faculty, staff, and students. Safety is the responsibility of every member of the campus community and individuals should know the appropriate actions to take when an emergency arises. In support of our commitment to the safety of the campus community the University has developed a Campus Safety Plan, <http://safetyplan.wsu.edu> It is highly recommended that you visit this web site as well as the University emergency management web site at <http://oem.wsu.edu/> to become familiar with the information provided.

### **Course Sustainability Statement:**

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