

## Principles of Environmental Toxicology – EnvS/FS 409/509 (3 cr) – Fall 2009

(ver 08.23.09)

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

**Prerequisites:** Recommended: Biol 102 or Biol 115, Chem 111, Chem112, Chem 275, and Stat 251.

**Instructor(s):** Greg Möller

**Office Location:** 204a Food Research Center

**Telephone:** 208-885-0401 or personal cell phone

**E-mail:** [gmoller@uidaho.edu](mailto: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 [etox@uidaho.edu](mailto:etox@uidaho.edu). Phone/text contact via personal cell phone # given to enrolled students. We will use Skype and/or other VOIP clients; Individual and small (<6) group voice conferencing via Skype ( [www.skype.com](http://www.skype.com) ). Students are invited to explore the virtual UI campus space in *Second Life* ( [www.sl.uidaho.edu](http://www.sl.uidaho.edu) ) for virtual group meetings. Both on-campus and off-campus students will view formal lectures over the Web. Lectures are available by streaming video Webcast (depending on the media players on your computer you may need free RealPlayer installed). 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 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.

#### Textbook:

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

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

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

**Blackboard:** [UI Blackboard](#) 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 40-75 minutes via streaming video. Downloadable lecture companion slide sets are 35-65 slides.

**Class Lecture Schedule:**

T 8/25	Introduction to Environmental Toxicology
Th 8/27	“Silent Spring”
T 9/1	Concepts of Toxicology
Th 9/3	Special Topics: Pesticide Residues
T 9/8	Dose-Response Relationships
Th 9/10	Absorption of Toxicants
T 9/15	Distribution and Storage of Toxicants
Th 9/17	Biotransformation and Elimination of Toxicants
T 9/22	Target Organ Toxicity
Th 9/24	Teratogenesis, Mutagenesis, and Carcinogenesis
T 9/29	Special Topics: Dioxins and Related Compounds
Th 10/1	<b>Midterm Exam I</b>
T 10/6	Risk Assessment I
Th 10/8	Risk assessment II
T 10/13	Case Studies: 1) Selenium Ecotoxicology 2) Arsenic in Drinking Water
Th 10/15	Ecological Biochemistry
T 10/20	Abiotic Transformation in the Environment
Th 10/22	Environmental Chemodynamics
T 10/27	Environmental Transport
Th 10/29	Environmental Chemicals I: heavy metals and metalloids; nutrients; radionuclides
T 11/3	Environmental chemicals II: heavy metals and metalloids; nutrients; radionuclides
Th 11/5	Environmental chemicals III: industrial chemicals, pesticides, petrochemicals, biotoxins
T 11/10	Environmental chemicals IV: industrial chemicals, pesticides, petrochemicals, biotoxins
Th 11/12	Special Topic: Endocrine Disruption
T 11/17	<b>Midterm Exam II</b>
Th 11/19	Special Topic: Dioxin and Related Compounds
T 11/24	<i>Thanksgiving break (no class)</i>
Th 11/26	<i>Thanksgiving break (no class)</i>
T 12/1	Monitoring Chemicals in the Environment
Th 12/3	Regulating Chemicals in the Environment: RCRA, CERCLA, CWA, CAA, FIFRA
T 12/8	Frontiers of Environmental Toxicology
Th 12/10	Course Review
T 12/15	<b>Final Exam</b>

**Readings:** As assigned on course Web site. Each lecture has reading assignments that will average 1-2 hours each.

**Homework:** As assigned on course Web site. Delivered online via *ETox* Blackboard site. Each lecture module has an online homework submission that will take approximately 30 minutes.

**Homework Projected Percent of Effort:**

**409 Homework**

50% Case study report

50% (total) Lecture homework problems

**509 Homework**

40% Case study report

20% (total) Lecture homework problems

40% 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 exams will take 4-8 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; 10 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 11/30. A numeric grading rubric for performance expectations will be available. Additional information is presented in the Resources section of the course web site.

**Graduate Credit Book Review:** Students taking the course for graduate credit will be required to perform a book review for a book from a recommended list found on the course Web site. 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 maximum length for this double spaced (1 inch margins; 12 pt font) report is 12 pages (fully inclusive)*. The completed review is to be submitted no later than 12/12. Additional information is presented in the Resources section of the course web site.

**Grading Breakdown:**

	<u>409 Students</u>	<u>509 Students</u>
Homework	25%	15%
Exams #1 and #2	25%	20%
Final Exam	20%	15%
Case Study Report	30%	30%
Book Review	Not required	20%

**Grade Distribution:** Varies year to year depending on student quality and course effort.

**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 (EnvS/FS 409/509). 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](#); [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. Please notify your instructor(s) during the first week of class regarding accommodation(s) needed for the course. All accommodations must be approved through Disability Support Services located in the Idaho Commons Building, Room 306; phone 885-6307; email at [dss@uidaho.edu](mailto:dss@uidaho.edu); website at [www.access.uidaho.edu](http://www.access.uidaho.edu) or [www.webs.uidaho.edu/taap](http://www.webs.uidaho.edu/taap).

WSU: Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, please visit the Disability Resource Center (DRC). All accommodations MUST be approved through the DRC (Washington Building, Room 217. Please stop by or call 509-335-3417 to make an appointment with a disability specialist.

**Plagiarism and Academic Integrity Addendum:****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]*

**Plagiarism statement and link to WSU academic integrity statement:** *Academic Dishonesty:* Cases of academic dishonesty shall be processed in accordance with the Academic Integrity Policy as printed in the *Washington State University Student Handbook, Faculty Manual*, and as available from the Office of Student Affairs.

**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 *Washington State University Student Handbook*.