

ES 120 Toxics in the Environment/ Fall 2009

<p>Instructor: Erik Muller muller(at)lifesci.ucsb.edu 570 9910 (personal cell; please, urgent matters only)</p> <p>Class room & Time: Girvetz 1116 Tu/Th 11:00-12:15am</p> <p>Office hours: Tu 9:45 – 10:45 am 2003 Noble Hall or by appointment</p> <p>Course web site: www.es.ucsb.edu/faculty/muller/es120</p>

This course is an introduction to environmental chemistry and ecotoxicology. In the lectures we will try to answer three central questions (these questions implicitly define the fields of environmental chemistry and ecotoxicology):

- What are the nature and characteristics of toxic compounds in the environment? Here we address the abiotic aspects of toxic compounds by examining their source and types, their chemical behavior in the (natural) environment and their fate.
- What are the effects of toxic compounds on biological systems? We discuss how organisms take up, process and accumulate toxic compounds. We also investigate toxicity mechanisms on the molecular and biochemical level, and examine how toxic compounds affect organisms, populations, communities and ecosystems.
- How do we assess environmental toxicity in practice? There are two parts to this question: the determination of the toxicity of a compound using standardized laboratory tests, and the assessment of the health of populations and ecosystems in affected areas.

These questions shape the first (and largest) part of the course outline. In addition, you will apply the questions to a case study, in which you integrate the expertise acquired in the first part to address a real life problem (I will hand out documentation about the case study later during the course).

Prerequisites

This is a science based course. In order to enroll via *GOLD*, you must have completed a couple of introductory biology and chemistry classes. Those are formal requirements. If you do not meet those requirements, you may still enroll by asking me for an approval code. Whether you meet or do not meet the requirements, I expect that **you have a basic understanding of major chemical and biological principles**. If you happen to struggle with something then **you take appropriate action**, such as asking questions in class, coming to office hours, reading up in text books or web sites and/or contacting me for help.

The Web: www.es.ucsb.edu/faculty/muller/es120

The web is the place where you can find the latest outline with correct due dates. The outline also contains all the links to homework, lecture materials and readings. You should check the latest outline before each class.

Course Materials

The text required for this course is

- Principles of Ecotoxicology by Walker, Hopkins, Silby and Peakall, third edition.

This book is available in the bookstore. If the book is late in the store, amazon.com is a reliable alternative (use a delivery option that ensures you'll have the book in time). In addition, I will draw quite a bit of material from

- Environmental Toxicology and Chemistry by D.G. Crosby;
- Introduction to Ecotoxicology by Connell, Lam, Richardson and Wu.
- Fundamentals of Ecotoxicology by Newman and Unger.

These books, as well as the required text, are kept in reserve at the library, where you can borrow them for maximally 24 hours at a time.

You will also need to watch

- the movie 'Erin Brockovitz' by director Steven Soderbergh, main actress Julia Roberts (available in local video stores).

You will also need to study the content of several web sites and a couple of documents; see the outline on the web for more details.

Grading

There are three parts contributing equally to your grade: assignments, final and case study.

Grade scale: A = 95% and up; B = 85%; C = 75%; D = 65%; F = 60% and below.

The **final** covers all the material covered in the course. This material is:

- All chapters of the book (**including** topics **not** discussed in class).
- All topics presented in class that are not covered in the text.
- All the depth and details discussed in class but absent in the book.
- All material of the home work assignments.
- The case studies are **not** part of the final.

The final aims at testing your

- understanding of major principles;
- knowledge of main mechanisms and key players;

Thus, the focus will be on the big picture, but some detail will be included as well. Also, you may be asked to apply your knowledge to a situation not dealt with in class.

You will receive a separate hand-out about requirements concerning the **case study**. There are three parts contributing to your grade: a written report (20% of final grade), oral presentation (10%) and contribution to the discussion following the oral presentation of others (3.3%). The report is due on the final day of the course.

Late papers cannot be considered. Attendance of presentations is required.

The **homework** assignments help you to integrate the lecture material and/or highlight some aspect. Assignments differ in length and importance. Consequently, the grade of each assignment is weighted to reflect

those differences (please see the Outline for how many points you can receive for each assignment). You can find the assignments on the web; due dates are in the outline (always check the latest one on the web). Do not copy-paste but write your own prose! Hand-ins should be printed; late work will not be accepted.

Get a better grade with less effort and less stress

Quite simply, what you get out of this course is what you put into it. If you want to do well, I expect that you

- Stay on track and stick to your schedule.
- Check the website often.
- **Come prepared to class.** Read assignments before lectures.
- **Study the material of the previous lecture before the next lecture** and bring your questions to class.
- Read up on subjects you feel less familiar with. Dig up your old organic chemistry/ biochemistry/ calculus/ etc books from your closet or borrow one from the library.
- Read up in the books that are kept in the reserve.
- **Use the office hours.**
- Timely submit print-outs of assignments. Late work and electronic submissions will not be accepted.
- When problems arise, contact me ASAP.
- Ask questions and ask questions (**the only dumb question is the question that is not asked**)