Instructors:
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Office TBA or hours by appointment anytime
Graduate Student Teaching Fellow: TBA

Philosophy of Course:
This course will focus on the effects of toxic chemicals in the environment, covering both humans and wildlife. Students will be introduced to basic concepts in toxicology and background information on the major classes of chemical contaminants of importance in the environment. Basic principles will be illustrated by discussion of case studies where damage has been documented. Issues related to infectious diseases will not be covered. By the end of this class students should understand the key factors controlling the distribution of chemicals in the environment and in the body, be aware of how major classes of chemicals cause toxicity, and be familiar with significant environmental threats to wildlife and society and their assessment.

This course is being offered concurrently with an undergraduate course on the same topic. All students will attend the same lectures, but graduate students will have different assessments, additional readings and writing assignments, and be required to write a more in depth term paper and prepare a more comprehensive paper presentation. It is anticipated that all students taking this course have had at least 1 semester of college biology and chemistry. Organic chemistry and biochemistry would be useful but is not an absolute requirement.

Learning objectives:
• Understand the basic concepts and approaches used to evaluate the effects of toxic chemicals in living organisms.
• Understand how major classes of chemicals cause toxicity.
• Appreciate the risk associated with exposure of humans and wildlife to chemical contaminants in the environment.
• Students will be expected to be able to critically read and summarize current literature in this field, and present this material in both short (1-2 page) reports and in a full length fully cited review paper, and present and defend their analysis.

Readings:
Unfortunately there is no really good textbook for this course. The basic material covered in the first part of the course on toxicology is well described by the textbook Principles of Biochemical Toxicology, 4th Edition by John A. Timbrell, published in 2009. I will cover material from 6 of the 7 chapters in this book. It will be available for purchase from the campus bookstore. However if you go to Amazon.com new and used copies from various sellers are available for less money, and I’ve been told older versions are available free on the web. Timbrell is a very basic book, but you should all be familiar with the material in it. There are questions at the end of each chapter (with answers) as well as an excellent glossary. For students really interested in toxicology, you should consider getting Casarett and Doull’s Toxicology the Basic Science of Poisons, 8th edition.
Edition, by C.D. Klaassen, McGraw Hill, 2013. Although huge (1,310 pages), this book sells for less than $80 new. PDFs of the previous edition are available on the web as well. All readings for the second portion of the course will be posted on Blackboard.

**Grading:**

To do well in this course it is important that you attend class and participate in class discussions. There will be two exams. Both will be open book, take home exams where you will be expected to write short (several page) essays on several topics covered in the course compete with citations. You will have some choice on the topics (e.g. I will pose more questions than you are expected to answer). Undergraduates will take in class closed book exams requiring less complete answers. Each exam will count 30% of your grade. You will have five days to complete the exams. You will also be expected to write a term paper on an approved (by me) topic of your choice, and make an oral presentation of your paper at the end of the term. The term paper and the presentation will count 25% of your grade. In addition, I will require you to write up short (1 page single spaced) synopses of 5 research or review papers assigned on material discussed in class. Each will count for 2% of your grade for a total of 10%. The final 5% of your grade will be based on your contribution to class discussion. Although this is a lecture class, I want to encourage class discussion, and will expect you to ask questions, and have read the material PRIOR to coming to class. Due to the large number of students in the class, I'm going to schedule a separate time for you to present your papers just to the other graduate students sometime during finals week (at a time to be mutually arranged). Although you are welcome and encouraged to attend the undergraduate student presentations, you are not required to do so.

**Web site:**

Class readings and presentation material will be posted on Bb. I will use the MAR 522 Bb site only to information specific to the graduate students, and to post your grades. All the rest of the course information (presentation material, readings, web links, schedule, schedule changes if necessary) will be posted on the MAR 394 Bb site. You will all be added as students to this site, and should monitor it regularly.

**Academic Dishonesty:**

Plagiarism is simply the use of others’ words and/or ideas without clearly acknowledging their source. As students, you are learning about other people’s ideas in your course texts, your instructors’ lectures, in-class discussions, and when doing your own research. When you incorporate those words and ideas into your own work, it is of the utmost importance that you give credit where it is due. Plagiarism, intentional or unintentional, is considered academic dishonesty and all instances will be reported to the Academic Judiciary. To avoid plagiarism, you must give the original author credit whenever you use another person’s ideas, opinions, drawings, or theories as well as any facts or any other pieces of information that are not common knowledge. Additionally quotations of another person’s actual spoken or written words; or a close paraphrasing of another person’s spoken or written words must also be referenced. Accurately citing all sources and putting direct quotations – of even a few key words – in quotation marks are required. For further information on plagiarism and the policies regarding academic dishonesty go to the Academic Judiciary website at [http://naples.cc.sunysb.edu/CAS/ajc.nsf](http://naples.cc.sunysb.edu/CAS/ajc.nsf).

**Disability Support Services:**

If you have a physical, psychological, medical or learning disability that may impact your
course work, please contact Disability Support Services, 128 ECC Building (631) 632-6748. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the following web site: http://www.ehs.sunysb.edu and search Fire safety and Evacuation and Disabilities.

**Critical Incident management:**
Stony Brook University expects students to respect the right, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn.

**Class Topics**

Course Introduction, History of Toxicology Timbrell Chapter 1  
Fundamentals of Toxicology and Dose-Response Relationships – Timbrell Chapter 2  

Factors Affecting Toxic Responses: Disposition – Timbrell Chapter 3  
Factors Affecting Toxic Responses; Metabolism – Timbrell Chapter 4  

Factors Affecting and Metabolism Disposition – Timbrell Chapter 5  
Toxic Responses to Foreign Compounds – Timbrell Chapter 6  

Chapter 6 continued & Discussion of Paper and Tox databases  
Epidemiology : Guest speaker, Dr. Elinor Shoenfeld,  
Stony Brook Department of Preventative Medicine  

Risk Assessment & Env. Legislation  
Endocrine disrupters  

Petroleum hydrocarbons  

Oil spill case studies  
Radiation – Irvin Huang  

Pesticides  
Pesticide case studies  

Synthetic Halogenated Compounds PCBs/Dioxins/PBDEs  
Emerging contaminants  

Metals  
Metal case studies  

Health outcomes associated with mercury in seafood. Dr. Jaymie Meliker  
Venomous and toxic plants and organisms – Irvin Huang
Harmful algal harmful blooms - Dr. Chris Gobler
Air Pollution

Genomics/proteomics/metabolomics
Molecular epidemiology - Dr. Jack Kovach
Careers in Env. Tox. and Public Health - Wrap up and review session