

Syllabus Biology 338 Environmental Toxicology Spring 2013

Professor: Dr. Sabrina Mueller-Spitz

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Office Hours: Wednesday 1:50-3:50 pm and Friday 10-11 am

Other times are available by appointment.

Course Materials: All lecture and discussion materials will be posted on D2L. An electronic textbook will be utilized throughout the semester. The book focuses on the biological aspects of toxicology specifically examining human systems with less information on the environmental topics. Additional sources will be used for the environmental and basic toxicant information, these will be posed on D2L content page.

Textbook: A Textbook of Modern Toxicology. Third Edition. 2004. E. Hodgson (Ed.).
John Wiley & Sons, Inc. (Posted on the D2L content page.)

Course Description: My objective for this course is to provide the students with an appreciation and understanding of the principles of environmental toxicology including but not limited to the following topics of basic chemistry of the toxicants, sources and fate contaminants in the environment and effects of toxicants upon humans, animals, microbes, and plants. The emphasis of this class is on contemporary problems in human health and the environment associated with environmental toxicants.

Course Objectives: The main objective of this course is to provide an understanding for the fate and impact of contaminants and toxicants on “organic” life. You will link together content from previous biology courses over the course of the semester. Upon completion of the course, the student should be able to:

1. Understand the fundamentals of toxicology and ecotoxicology.
2. Apply toxicology principles to the fate of toxicants and contaminants in the environment.
3. Characterize the biological impacts of toxins and contaminants on life.
4. Assess sustainable ways to reduce pollution and release of toxicants.
5. Critically evaluate environmental toxicology topics in the media and the science behind these studies.
6. Be able to critically evaluate, discuss, explain, and present current topics in environmental toxicology primary scientific literature.

Course Policies:

Regarding Email messages, to expedite a response your email, the title NEEDS to include BIOL 338, which allows me know the context of the message. Emails received over the weekend may not be responded to until the following day. Please write detailed email messages.

All mobile devices will not be allowed in class (i.e. keep these stored in your coats or backpacks). If a mobile device is visible or interrupts class for any reason, you will LOSE 20 points from your final grade (~5% of your final grade).

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Academic Dishonesty: Cheating on an exam, plagiarism, or any other form of academic dishonesty associated with presentations or any written element for class will be dealt with in accordance with the current UWS Student Code of Conduct section 14.01 (http://docs.legis.wisconsin.gov/code/admin_code/uws/14.pdf). Please read this document and understand what is considered academic dishonesty. ***Any violation of related to Student Code of Conduct will be dealt with on an individual basis according to the severity of the misconduct.***

Assessment (Course Assignments and Exams):

1. ***Exams:*** There will be three short answer and essay exams. Any content from class could be included on the exams. Class members will have the opportunity to contribute to exam content, which also serves as a study guide. One week before the exam, students have the opportunity to post exam questions on the D2L discussion page. Exam 1 & 2 will be administered during lecture. Exam 3 will cover the final lecture topics and have a large comprehensive component. This will be a take home exam due on the final day of the class during class time (a late exam will NOT be accepted for a grade). If a student misses an exam because of extreme circumstances (e.g. death of a close relative or a documented medical excuse) the student will be allowed to take a replacement exam. It is the student's responsibility to contact the professor before or immediately following the missed exam to make arrangements. Lack of planning on the student's part could result in earning a failing grade in the course. The grade earned on this replacement exam will be substituted for the one missed exam.

2. ***Class Discussions:*** The purpose of the in-class discussions are three-fold: 1) allow us to investigate a single topic in depth, 2) develop &/or hone your critical analysis of primary literature, and 3) expand upon your scientific communication skills with your peers. There will be four discussions over the semester. The topics for each discussion will be determined by members of the class to illustrate the topics of 1) emerging toxicants, 2) fate and transport of toxicants, 3) biological effects on human or animals and 4) risk assessment. For each discussion, two different papers will be used to examine different aspects of the same topic. However, each student is required to read ONLY one of the papers.

If you are not associated with leading the discussion, you need to read ONE discussion paper before class and come to class ready to discuss the scientific paper and the general topic. **To earn points for the discussion you MUST contribute ORALLY (No talking, No points).**

Discussion Leaders: Each student will sign-up for one discussion. The discussion leaders are required to:

1. Provide an idea(s) for the discussion in the form of a question that would be addressed with the primary literature. Your contribution could also be in the form of a primary literature paper that could be used for the discussion. Your ideas/comments need to be posted on D2L discussion page **2 weeks before the discussion date**, allowing other members of the class to comment about the topics/ideas and allowing the professor time to find and post papers. (If you do not share an idea for the discussion, you will lose 2 points of the discussion grade.)

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2. Write one discussion question to facilitate discussion of the topic. This question will be posted for the other students on the D2L discussion board.
3. Help explain key figures/tables for the scientific paper that you read for class.
4. Pose your discussion question to the other class members.

3. *Current News in Environmental Toxicology*: Due to the vast topics and various interests of the members of the class, there will be student presentations to expand our understanding of “hot topics” in Environmental Toxicology. **Each student is required to present a recent news story in ANY aspect of environmental toxicology.** The story can come newspapers, magazines, or internet sources. The story needs to be relatively recent, which means the stories need to be from the last year (2012-present).

The class presentation needs to include:

1. An introduction to the topic of the story.
2. The context of the story **MUST** be supported by information obtained from primary scientific literature.
3. Highlight key environmental toxicology themes of the news story.
4. Explain the contribution of this story to understanding to the different aspects of the field (e.g. policy, toxicokinetics, risk assessment, exposure routes, fate or transport of toxicants, biological effects, ecological changes consequences, etc.).
5. Include ALL References on your final slide. The citation style to be used for the references is CSE (additional information can be obtain at <http://ia.juniata.edu/citation/cse/>).

You will be graded on the quality of the presentation based on 1) the information presented, 2) adherence to guidelines of the assignment, 3) inclusion of ANY references used to obtain additional information, 4) adhering to the time limit of 3-5 minutes, 5) oral presentation style, and 6) the news story and presentation must be posted on the D2L discussion board before class (**late postings will result in a loss 10% of the total news story grade**). An example will be presented by the professor in the first week of class.

4. *In-Class Activities*: Over the course of the semester, there will be unannounced GRADED activities, which will include short quizzes, take home questions, and group work. ***If you are not present the day these activities are presented/assigned you will be UNABLE to make up these points.***

5. *Homework*: These five assignments will allow you to further examine various topics presented in class. Each assignment will be posted on the D2L drop-box, where the instructions, reading material, or internet sites will be listed. ***Late assignments will be accepted, but for each day the assignment is late, you will lose 10% of your total grade.*** Late assignments should be up-loaded to the late drop box.

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Important Dates:

Exams	Discussions	Homework
February 27	February 18	February 4
April 8	March 13	March 8
May 8	April 15	April 5
	May 8	April 19
		April 30

_____ My Presentation date & _____ My Discussion date

Point Breakdown	Your Points
Exam 1: 75 points Exam 2: 75 points Exam 3: 100 points	
5 Homework Assignments: 75 points 15 points per assignment	
In-class activities: 25 points	
Presentations: 25 points	
Discussion contribution: 15 points (5 pts per discussion)	
Discussion facilitators: 10 points	
Total Points: 400 points	

GRADING SCALE:

93-100 %	A
90-92.9 %	A-
87-89.9 %	B+
82-86.9 %	B
81.9-80 %	B-
77-79.9 %	C+
71-76.9 %	C
69-70.9 %	C-
67-68.9 %	D+
61-66.9 %	D
60.9-60 %	D-
less than 60	F

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Topic	Readings
Historical Context of Environmental Toxicology	Ch1: Introduction to Toxicology Additional peer review sources will be provided on D2L
Classification/Breakdown of Toxicants and Contaminants Type	Ch5: Classes of Toxicants: Use Classes
Green Chemistry	Li and Anastas 2012 Chem Soc Rev 41:1413-1414 Additional peer review sources will be provided on D2L
Toxicant Transport and Fate into the Environment (including air, water, & soil)	CH4: Exposure Classes CH 27: Transport and Fate of Toxicants in the Environment Additional peer review sources will be provided on D2L
Bioaccumulation & Ecology Impacts	Ch 26: Basics of Environmental Toxicology Additional peer review sources will be provided on D2L
Clean-up Strategies (focusing on bioremediation and biodegradation)	Ch 26: Basics of Environmental Toxicology Additional peer review sources will be provided on D2L
Dose-response & Toxicity Testing	CH 21: Toxicity Testing CH 11: 11.3 Dose Response
Toxicokinetics & Exposure	CH 6: Absorption and Distribution of Toxicants CH 10: Elimination of Toxicants
Metabolism of Toxicants	CH 7: Metabolism of Toxicants CH 8: Reactive Metabolites
Toxicant Interactions with Major Body Systems	CH 14: Hepatotoxicity CH18: Respiratory Toxicity CH 20: Reproductive System
Endocrine Disruptors	CH17: Endocrine System Additional peer review sources will be provided on D2L
Carcinogenesis	CH12: Chemical Carcinogenesis Additional peer review sources will be provided on D2L
Neurotoxicity	CH16: Toxicology of the Nervous System Additional peer review sources will be provided on D2L
Risk Assessment	CH24: Human Health Risk Assessment CH 28: Environmental Risk Assessment