

Syllabus Biology 338 Environmental Toxicology Spring 2014

Professor: Dr. Sabrina Mueller-Spitz

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Office Hours: Monday 2-3:30 pm and Tuesday 10-11:30am

Other times are available by appointment.

Course Description: 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 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 course D2L content page.)

Course Objectives: The main objective of this course is to provide an understanding for the fate and impact of contaminants and toxicants on life. Students will integrate content from previous biology and chemistry courses with environmental toxicology over the course of the semester. Upon completion of the course, the student should be able to:

1. Recognize the various types of agents, hazards, and emerging chemicals of concern.
2. Understand the principles that govern the fate and movement of toxicants, pollutants, and contaminants in natural and man-made environments environment.
3. Assess sustainable ways to reduce pollution and the release of toxicants.
4. Understand how we determine the toxicity of hazards.
5. Characterize the biological effects of various agents on animals and humans.
6. Assess the risk posed to the environment and life from various agents.
7. 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 recipient of the message. Emails received over the weekend may not be responded to until the following day. Only detailed email messages will be responded to in a timely manner.

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. Exam 1 and 2 will be administered in testing services located in Polk Library. Exam 3 will be administered during lecture on the final day of the class. 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 for the make-up exam. 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 purposes of the in-class discussions are three-fold: 1) allow us to investigate a single topic, 2) develop and/or hone your critical analysis of primary literature, and 3) expand upon your scientific communication skills. There will be four discussions over the semester. The topics for each discussion will be determined by members of the class to illustrate the general topics of 1) emerging toxicants, 2) fate and transport of toxicants, 3) biological effects on human or animals, and 4) risk assessment.

Discussion Leaders: Each student will sign-up for one discussion.

The discussion leaders are required to:

1. Provide an idea(s) as the basis/topic for the discussion. Your contribution could also be in the form of a primary literature paper that could be used for the discussion. Your ideas, comments, or papers must to be posted on D2L discussion page **2 weeks before the discussion date**. This allows the discussion leaders time to comment on the topics/ideas and provides 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. (2 points)
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. (2 points)
3. Help explain key figures/tables from the scientific paper that you read for class. (1 point)
4. Pose your discussion question to the other class members. (1 point)
5. Write a paragraph about the ideas and concepts that you took away from the paper and in-class discussion and how this topic applied to your daily life. This write-up will be due within two days of your discussion. (14 points) ***Late assignments will be accepted, but for each day the assignment is late, you will lose 10% of your total grade.***

Discussion Contributors:

- 1) Need to read a discussion paper before class

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2) Come to class ready to discuss the scientific paper, the general topic and how it fits within the lecture material. **To earn points for the discussion you MUST contribute ORALLY. No talking means no points will be earned.**

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 from newspapers, magazines, or internet sources. The story needs to be relatively recent, which means the stories need to be from the last year (2013-present). You will have ~5 minutes for your class presentation. 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.

The class presentation needs to include the follow items:

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 various 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 the individual slides and have a final reference slide. The citation style to be used for the references is CSE (additional information can be obtained at <http://ia.juniata.edu/citation/cse/>)
6. Your presentation and news story link **MUST** be posted before lecture.

Graded Elements of Presentation	Points (25 pts)
<u>Presentation Items</u> Introduction to topic found in the news story Presentation of supporting information gathered from primary scientific literature Explain how this topics fits with key environmental toxicology themes	10
<u>References (CSE: Council of Science Editors format)</u> all sources should be indicated on each slide final reference slide is needed	5
Time Limit (3-5 minutes)	2
Presentation Style: Speed, Volume, Pose, Flow & Clarity	5
Posting of News Story & PowerPoint Presentation (LATE POSTINGS will results in a 10% of total points for the presentation)	3

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.**

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5. Homework: These four 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 uploaded to the late drop box.

IMPORTANT DATES		
Exams	Discussions	Homework
March 6 or 7	February 24	February 14
April 10 or 11	March 19	March 14
May 14	April 21	April 14
	May 12	May 2

Point Breakdown	Your Points
Exam: 260 points Exam 1: 75 points Exam 2: 80 points Exam 3: 100 points	
Homework Assignments: 60 points 15 points per assignment	
In-class activities: 25 points	
Presentations: 25 points	
Discussion Contributors: 15 points (5 pts per discussion)	
Discussion Leaders: 20 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
60-60.9 %	D-
Less than 60%	F

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Course Schedule		
Wk	Topics	Readings
1	Historical Context of Environmental Toxicology	Ch1: Introduction to Toxicology Additional peer review sources will be provided on D2L
2	Classification/Breakdown of Agents: chemical, physical, biological Nanotechnologies Green Chemistry	Ch5: Classes of Toxicants: Use Classes Li and Anastas 2012 Chem Soc Rev 41:1413-1414 Additional peer review sources will be provided on D2L
3 4 5	Toxicant Transport & Fate in the Environment Atmospheric Water: Drinking & Wastewater Soil	CH4: Exposure Classes CH 27: Transport and Fate of Toxicants in the Environment Additional peer review sources will be provided on D2L
6	Climate Change Bioaccumulation Impacts upon wildlife	Ch 26: Basics of Environmental Toxicology Additional peer review sources will be provided on D2L
7	Clean-up Strategies Bioremediation Phytodegradation	Ch 26: Basics of Environmental Toxicology Additional peer review sources will be provided on D2L
8	Dose-Response Toxicity Testing Exposure Routes Toxicokinetics	CH 21: Toxicity Testing CH 11: 11.3 Dose Response CH 6: Absorption and Distribution of Toxicants CH 10: Elimination of Toxicants
9	Metabolism of Toxicants	CH 7: Metabolism of Toxicants CH 8: Reactive Metabolites CH 9: Chemical and Physiological Influences on Xenobiotic Metabolism
10	Toxicant Interactions with Major Body Systems	CH 14: Hepatotoxicity CH 18: Respiratory Toxicity CH 20: Reproductive System Ch 13: Teratogenesis
11	DNA Damage Epigenetics Carcinogenesis	CH12: Chemical Carcinogenesis Additional peer review sources will be provided on D2L
12	Endocrine Disruptors Obesogens	CH17: Endocrine System Additional peer review sources will be provided on D2L
13	Neurotoxicity Risk Assessment	CH16: Toxicology of the Nervous System CH24: Human Health Risk Assessment CH 28: Environmental Risk Assessment
14	Discussion 4 Exam 3	To be determined.