

SYLLABUS – FALL 2013

ENVS 401/501 – CHEMISTRY OF THE ENVIRONMENT

Course Description:

This course provides an in-depth study of the application of chemical principles to environmental processes. It will provide a foundation in chemical concepts and problem-solving skills needed in environmental chemistry and engineering.

Course Objectives:

- use chemical equations and properties to predict changes in the composition of environmental samples and locations
- identify what calculations and analyses are needed to evaluate environmental scenarios
- improve problem solving skills, particularly in the solution of multi-step calculations

Instructors:

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Prerequisite (for ENVS 401): CHEM 102 General Chemistry II

Required Textbook:

Chemistry for Environmental Engineering and Science, 5th edition, by C.N. Sawyer, P.L. McCarty and G.F. Parkin, McGraw-Hill, 2003.

Meeting Time: Wednesday 6:00 – 8:50 PM

Location: PISB 104

Website:

The official course website will be located on Bb Learn, accessible through your Drexel One account (“My Courses” link), or directly, through the following website: <https://learn.dcollege.net/>. Please check this site frequently as important information will be posted on a regular basis.

Grading:

Midterm Exam (25%)

The midterm exam will include both individual and group components. Most of the grade (75%) will be based on homework-type questions answered individually. The remainder of the grade (25%) will be based on a set of multiple choice questions that will be answered individually and then in your regular working group (see *Participation* below for more information about the groups).

Final Exam (25%)

The final exam will not be cumulative with respect to content. The exam will test content covered after the midterm exam, although techniques covered prior to the midterm may also appear on the final exam. The final exam configuration and grading scheme will be the same as on the midterm exam.

Homework problems (20%)

Homework will be due by the end of class each week, unless otherwise instructed, with the exception of week 1. Each assignment will be worth 10 points towards your total homework grade: 5 points for completion of all problems and 5 points for 1 randomly selected problem. Late homework must be turned in by **5 PM** the day after it is due, and will **not** be accepted after that time. 3 points (of the 10) will be deducted from late homework. Graduate students will have an additional homework problem to do each week. These problems will be clearly identified.

End-of-term Project (15%)

Students will work in groups of two or three. Each group will be required to create a public service announcement (PSA) for a chemical that has some environmental significance. This topic cannot be duplicated by another group.

The format of the project is entirely up to each group, although the project must incorporate some form of media, and must be uploadable to the course website. You may create a video, or a powerpoint presentation, or an audio file. You could also write a print PSA, although the PSA must include images (as the media component). The science content in each project must be accurate, and all media and references must be appropriately cited. Students should take care to avoid copyright infringements. You must use at least three references, one of which must be from a peer-reviewed, scientific journal.

An outline will be due at the end of week 6. Each group will be required to post a weekly blog entry to the course website. These entries will begin in week 5, and should include a brief summary of the group's progress that week, identifying each member's contribution. An entry must be submitted even if no progress was made that week. Final projects must be submitted to the course website by Tuesday, December 3, at 11:59 PM. Additional information about the project will be provided later in the term.

Graduate students will be required to write a one-page summary of an article from a peer-reviewed journal that discusses their chemical.

Participation (15%)

There will be three, equally weighted components to your participation grade. (1) Each student will be assigned a personal response device ("clicker") to use this term. Full credit will be given for responses to at least 75% of the questions asked during the course of the term. Your grade will NOT be based on the correctness of your answers; only that you submit an answer. (2) Each week you will spend part of the class period working in groups. You are expected to be an active participant in your group. The instructor will be the primary evaluator of this participation; however each group will have a student evaluator who will provide input regarding the participation of each group member. (3) A discussion board will be available on the Bb Learn website for this class. For full credit, undergraduate students must post 3 items to the discussion board, and graduate students must post 5 items. Posts may include questions about a homework problem or something covered in class, answers to someone's previously posted question, or tips for

answering a homework problem. Each post must include a complete and unique thought; simple agreement with a previous posting will not count to your total.

Final grades will be determined according to the following scale:

A+: 98 – 100	C+: 77 – 79
A: 93 – 97	C: 73 – 76
A-: 90 – 92	C-: 70 – 72
B+: 87 – 89	D+: 67 – 69
B: 83 – 86	D: 60 – 66
B-: 80 – 82	

Cheating:

While collaboration on homework is encouraged, direct copying of answers is not permitted and will result in a zero for that assignment. Any cheating during an exam will result in a score of zero for the exam. Serious or repeated offenses will be reported to the University. For more information, see material in “academic dishonesty” at the following link:

http://www.drexel.edu/provost/policies/academic_dishonesty.asp

Disability Services:

Students with disabilities should see the “Health and Disability Services” tab at the following link: http://drexel.edu/studentaffairs/community_standards/studentHandbook/

Students who wish to request accommodations and services at Drexel University need to present a current accommodation verification letter (“AVL”) to the instructor before accommodations can be made. AVL's are issued by the Office of Disability Resources (“ODR”); <http://www.drexel.edu/ODS/index.html>.

Course Schedule:

Date	General Topic	Chapters
9/25	wastewater treatment - ammonia	3.10-3.11; 25
10/2	mercury contamination	2.11-2.14; 3.2; 34.5
10/9	acid rain	2.13; 4.5; 16; 17; 29
10/16	wastewater treatment - acids	4.6-4.7; 4.11; 32
10/23	Midterm Exam / student choice	
10/30	water quality	13; 19; 26; 34
11/6	chromium contamination	2.7-2.8; 4.8-4.10; 34
11/13	wastewater treatment - pesticides	3.12; 20; 26; 34
11/20	killer lakes	2.9; 18
11/27	No class – Thanksgiving	
12/4	ozone - friend or foe?	5.8; 5.34; 20.7
12/11	Final Exam	