SYLLABUS & COURSE INFORMATION

SCHOOL OF PUBLIC HEALTH
UNIVERSITY OF MINNESOTA

PUBH 6190, SECTION 1

Environmental Chemistry
Fall 2018

COURSE & CONTACT INFORMATION

Credits: 3
Meeting Day(s): Tu-Th
Meeting Time: 9:45-11:00
Meeting Place: Moos 1-440

Instructor: Matt Simcik
Email: msimcik@umn.edu
Office Phone: 6-6269
Fax: 6-0650
Office Hours: by appointment
Office Location: Mayo 1108

COURSE DESCRIPTION

The class is a survey course that describes basic atmospheric chemistry principles, water chemistry principles, and soil chemistry principles and presents the chemistry behind current challenges to our air, water and soil environments. The last third of the course focuses on understanding the linkages and interactions of these three environmental media, and on gaining a quantitative understanding of how pollutants behave in the environment.

COURSE PREREQUISITES

One course each in gen chem, org chem or instr consent

COURSE GOALS & OBJECTIVES

After completing this course, you should:

1. Be able to set up the equations to predict the relative distribution of a chemical among environmental media within relative significant figures given its physical/chemical properties and environmental conditions.
2. Be able to evaluate an historic chemical from the perspective of efficacy and environmental impact and make a compelling recommendation on whether or not it should have been registered under the Toxic Substances Control Act (TSCA).

METHODS OF INSTRUCTION AND WORK EXPECTATIONS

Course Workload Expectations
Environmental Chemistry is a 3 credit course. The University expects that for each credit, you will spend a minimum of three hours per week attending class or comparable online activity, reading, studying, completing assignments, etc. over the course of a 15-week term. Thus, this course requires approximately 135 hours of effort spread over the course of the term in order to earn an average grade.

Learning Community
School of Public Health courses ask students to discuss frameworks, theory, policy, and more, often in the context of past and current events and policy debates. Many of our courses also ask students to work in teams or discussion groups. We do not come to our courses with identical backgrounds and experiences and building on what we already know about collaborating, listening, and engaging is critical to successful professional, academic, and scientific engagement with topics.

In this course, students are expected to engage with each other in respectful and thoughtful ways.

In group work, this can mean:

- Setting expectations with your groups about communication and response time during the first week of the semester (or as soon as groups are assigned) and contacting the TA or instructor if scheduling problems cannot be overcome.
- Setting clear deadlines and holding yourself and each other accountable.
- Determining the roles group members need to fulfill to successfully complete the project on time.
- Developing a rapport prior to beginning the project (what prior experience are you bringing to the project, what are your strengths as they apply to the project, what do you like to work on?)

In group discussion, this can mean:

- Respecting the identities and experiences of your classmates.
- Avoid broad statements and generalizations. Group discussions are another form of academic communication and responses to instructor questions in a group discussion are evaluated. Apply the same rigor to crafting discussion posts as you would for a paper.
- Consider your tone and language, especially when communicating in text format, as the lack of other cues can lead to misinterpretation.

Like other work in the course, all student to student communication is covered by the Student Conduct Code (https://z.umn.edu/studentconduct).

COURSE TEXT & READINGS

The required readings include the textbook, Environmental Chemistry 9th Edition, by Manahan, and a collection of scientific journal articles.
The text can be purchased online. The book is a useful resource, and you will be responsible for reading most of it thoroughly.
The final third of the course we will focus on readings from the literature, as there is no available text that covers this material sufficiently. The journal articles will be accessible via Moodle.

Section I.	Manahan Ch. 1, 2, 4
Section II.	Manahan Ch. 9 - 14
Section III.	Manahan Ch. 15, 16
Section IV.	Manahan Ch. 3, 5, 7
Section V.	Journal Articles

Note: the other chapters in Manahan are strongly encouraged but not required.

COURSE OUTLINE/WEEKLY SCHEDULE

Week	Topic	Readings	Activities/Assignments
Week 1 9/4, 9/6	• Basic Concepts	• Manahan Ch. 1, 2, 3	• Environmental chem, acid base • Redox, complexation, equilibria • Kinetics Homework/in-class
Week 2 9/11, 9/13	• Atmosphere	• Manahan Ch. 9-14	• Characteristics, reactivities, O_2 reactions
Week 3 9/18, 9/20	• Atmosphere	• Manahan Ch. 9-14	• Ozone Depletion, Global Climate Change, Criteria pollutants, photochemical smog
Week 4 9/25, 9/27	• Atmosphere	• Manahan Ch. 9-14	• Particles, toxic air pollutants
Week 5 10/2, 10/4	• Atmosphere/Lithosphere	• Manahan Ch. 15, 16	•
Week 6 10/9, 10/11	• Lithosphere/Hydrosphere	• Manahan Ch. 3, 5, 7	•
Week 7 10/16, 10/18	• Hydrosphere	• Manahan Ch. 3, 5, 7	•
Week 8 10/23, 10/25	• Hydrosphere	• Manahan Ch. 3, 5, 7	• Review and Discussion on 10/25
Week 9 10/30, 11/1	• Exam/ Fate and Transport	• Journal Articles	• Exam on 10/30
Week 10 11/6, 11/8	• Fate and Transport	• Journal Articles	•
Week 11 11/13, 11/15	• Fate and Transport	• Journal Articles	•
Week 12 11/20	• Fate and Transport	• Journal Articles	•
Week 13 11/27, 11/29	• Fate and Transport	• Journal Articles	•
Week 14 12/4, 12/6	• Fate and Transport	• Journal Articles	•
Week 15 12/11	• Fate and Transport	•	•

SPH AND UNIVERSITY POLICIES & RESOURCES

The School of Public Health maintains up-to-date information about resources available to students, as well as formal course policies, on our website at www.sph.umn.edu/student-policies/. Students are expected to read and understand all policy information available at this link and are encouraged to make use of the resources available.

The University of Minnesota has official policies, including but not limited to the following:

- Grade definitions
- Scholastic dishonesty
- Makeup work for legitimate absences
- Student conduct code
- Sexual harassment, sexual assault, stalking and relationship violence
- Equity, diversity, equal employment opportunity, and affirmative action
- Disability services
- Academic freedom and responsibility

Resources available for students include:

- Confidential mental health services
- Disability accommodations
- Housing and financial instability resources
- Technology help
- Academic support

EVALUATION & GRADING

Two exams (60%), Project (30%), Homework (8%), Participation (4%)

The exams are approximately equally spaced through the semester, and are evenly weighted. The group project is the same weight as the exams. The homework is for your benefit, to test your understanding and to practice your problem solving skills; the credit for turning them in is an incentive to do them (pass-fail). I do not grade them but instead supply answers to assist as a study guide. You are expected to actively participate in class by asking questions and by participating in discussions. Participation in class will enhance your final grade if your grade falls between grades, and is weighted at 4%.

Students may change grading options during the initial registration period or during the first two weeks of the semester. The grading option may not be changed after the second week of the term.

Grading Scale
The University uses plus and minus grading on a 4.000 cumulative grade point scale in accordance with the following, and you can expect the grade lines to be drawn as follows:

% In Class	Grade	GPA
93 - 100%	A	4.000
90 - 92%	A-	3.667
87 - 89%	B+	3.333
83 - 86%	B	3.000
80 - 82%	B-	2.667
77 - 79%	C+	2.333
73 - 76%	C	2.000
70 - 72%	C-	1.667
67 - 69%	D+	1.333

63 - 66%	D	1.000
< 62%	F	

- A = achievement that is outstanding relative to the level necessary to meet course requirements.
- B = achievement that is significantly above the level necessary to meet course requirements.
- C = achievement that meets the course requirements in every respect.
- D = achievement that is worthy of credit even though it fails to meet fully the course requirements.
- F = failure because work was either (1) completed but at a level of achievement that is not worthy of credit or (2) was not completed and there was no agreement between the instructor and the student that the student would be awarded an I (Incomplete).
- S = achievement that is satisfactory, which is equivalent to a C- or better
- N = achievement that is not satisfactory and signifies that the work was either 1) completed but at a level that is not worthy of credit, or 2) not completed and there was no agreement between the instructor and student that the student would receive an I (Incomplete).

Evaluation/Grading Policy	Evaluation/Grading Policy Description
Scholastic Dishonesty, Plagiarism, Cheating, etc.	You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis (As defined in the Student Conduct Code). For additional information, please see https://z.umn.edu/dishonesty The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: https://z.umn.edu/integrity. If you have additional questions, please clarify with your instructor. Your instructor can respond to your specific questions regarding what would constitute scholastic dishonesty in the context of a particular class-e.g., whether collaboration on assignments is permitted, requirements and methods for citing sources, if electronic aids are permitted or prohibited during an exam. Indiana University offers a clear description of plagiarism and an online quiz to check your understanding (http://z.umn.edu/iuplagiarism).
Late Assignments	
Attendance Requirements	
Extra Credit	

CEPH COMPETENCIES

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Resources for filling out the CEPH competencies grid are available on isph:
http://www.isph.umn.edu/sph/instructor-resources/

Competency	sment Strategies