ESM 231: Fundamentals of Environmental Chemistry II
Winter 2024

Instructor: Professor L. A. George
Office Hours: by appointment
Contact info: e-mail georgeL@pdx.edu, phone - 503-725-3861
Teaching Assistants:
Required Textbook: Waldron

Open Access:
Van Gestel, C.A.M., Van Belleghem, F.G.A.J., Van den Brink, N.W., Droge, S.T.J., Hamers, T., Hermens, J.L.M., Kraak, M.H.S., Löhr, A.J., Parsons, J.R., Ragas, A.M.J., Van Straalen, N.M., Vijver, M.G. (Eds.) (2019). *Environmental toxicology, an open online textbook.*
https://maken.wikiwijs.nl/147644/Environmental_Toxicology__an_open_online_textbook

Course Description:
The course will cover basic concepts and principles of chemistry as they apply to environmental problems. This will include the nature of matter and chemical reactions, water chemistry, water pollution, atmospheric chemistry, soil chemistry, toxicological chemistry and industrial ecology. Examples will be used that illustrate the social and economic importance of environmental chemistry. Students will also explore environmental chemistry concepts in a concurrent laboratory session (ESM 231L).

Course Schedule:
Students should come prepared to class having read the chapter and/or articles for the week.

Tentative Schedule:

		In Class	HW DUE Fridays @ 11:59	In Lab
Week 1	Intro Biochemistry and Toxicology	W: Chapter 5	HW#1: Chapter 5	Part 1: Introduction to Hazards Part 2: Laboratory Skills - Pipetting and Weighing
Week 2		W: Chapter 14	HW#2: Chapter 14	Molecular Models
Week 3		Mini-test #1 - Biochem and Toxicology Start Water		Enzyme Lab
Week 4	Environmental Chemistry of Water	W:Chapter 8	HW#3: Chapter 8	pH measurements
Week 5			HW #4:	Hardness of Water
Week 6		Mini Test #2 Start Gas Laws		Chloride in Seawater
Week 7	Environmental Chemistry of the Atmosphere	W:Chapter 6	HW#5: Chapter 6	passive sampling of NO2
Week 8			HW #6:	mini- GIS mapping
Week 9		Mini Test # 3 Soil		passive sampling analysis of NO2
Week 10	Soil Chemistry	Soil	HW#7:	no lab (snow day)

Graded Work:

Homework assignments 5@ 25 pts each	125 pts. (32%)
Mini- Area tests (40 minutes) 3 @ 50pts each	150 pts (16%)
Pre-lab Quizzes 9 @10 pts each	70 pts. (13%)
Lab reports 9 @ 20 pts each	180 pts. (21%)
Final Exam Monday March 19th 1015-1205	100 pts. (18%)

Description of Graded Work:

Weekly homework assignments 9 @ 20 pts each

Weekly homework assignments will be due on Monday 5PM each via the dropbox in the course D2L site.

Late Assignments: Late assignments will be penalized **10%/day** (first day starts after due date/time). If you have a documented extended illness or other emergency, let us know and we will discuss other deadline arrangements.

Mini- Area tests (40 minutes) 3 @ 50 pts each

These tests will assess your understanding of the material covered over the major topic areas in the course: Toxicology, Water Chemistry, Atmospheric Chemistry and Soil Chemistry. Preparation for these open book and notes tests should include review of the relevant chapters, HW, lecture notes and the research articles.

Pre-lab Quizzes 7 @10 pts each

Students must prepare for lab sessions by reading and thinking through the lab instructions. Quizzes are designed to assess your preparation to conduct the assigned laboratory project with good understanding of the procedures and underlying science.

Lab reports 8 @ 20 pts each

Lab reports formats will vary with each lab and will be posted on D2L. Lab reports will be due one week from the completion of the lab.

Late Assignments: Late assignments will be penalized **10%/day** (assignments are due at the beginning of class. If you have a documented extended illness or other emergency, let us know and we will discuss other deadline arrangements.

Final Exam Monday March 13th 1015-1205 100pts

The final exam will include short answer, problems and multiple choice questions based on four research articles in the topic areas for the courses. The open book, notes and articles exam is designed to assess your ability to apply knowledge from the course in a real world context.

Grading Scale:

A 94 – 100	B+ 87 – 89	C+ 77 – 79	D+ 67 – 69
A- 90 – 93	B 83 – 86	C 73 – 76	D 63 – 66
	B- 80 – 82	C- 70 – 72	D- 60 – 62

Statement on Academic Honesty: Plagiarism or academic dishonesty of any form will not be tolerated in this class and will result in a failing grade for the assignment. All disputed cases of academic dishonesty will be referred to the Office of Student Affairs for arbitration. For more information, please see the Academic Honesty Policy in Portland State University's "Bulletin".