

CIV ENV 370: EMERGING CONTAMINANTS

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COURSE DESCRIPTION

What is new car smell, and will it give me cancer? Civ Env 370 examines the fundamental processes that govern the fate of contaminants in natural and engineered environments with a specific focus on indoor air quality. The goal of this course is to provide students with an understanding of environmental chemistry. At the end of the course, students will be able to identify emerging contaminants of concern and predict their fate based on properties of the chemical and the contaminated environment. Based on those predictions, students will be able to make inferences about human exposure to those contaminants and implications for human and public health. Evaluation for the course is based on online assignments, in-class presentations, and a final paper.

PREREQUISITES

- CHEM 210-1
- BMD ENG 250 or equivalent (recommended)

OBJECTIVES

- Learn the basics of environmental organic chemistry.
 - Partitioning
 - Sorption
 - Transport
- Identify potential personal exposures to emerging contaminants.
- Make ethical assessments of the risks associated with certain chemistries.

OUTCOMES* - Upon successful completion of this course, students have:

- an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics (ABET 1)
- an ability to communicate effectively with a range of audiences (ABET 3)
- an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts (ABET 4)

* OUTCOMES correspond to Environmental Engineering Outcomes which are adopted from the ABET 1-7.

RECOMMENDED TEXT

- *Environmental Organic Chemistry* (2017), Wiley
- Course packet of selected readings (links or PDFs on Canvas)

- *Elements of Environmental Chemistry* (2020), Wiley (optional)

ASSESSMENT

- Assignments (problems, short answer) (30%)
- Student-led discussion (50%)
- Final paper (20%)

Late work will be accepted at the professor's discretion.

Participation: This class is interactive. Students are expected to ask questions and offer responses during class. Class time devoted to doing assignments will require students to work independently and in groups.

Student-led discussions (group activity): Each student will present and lead a discussion on 1-3 topics from the textbook. Grades will be based on demonstrated preparation, comprehension and/or informed questioning of the topic, and ability to communicate with and engage the class.

Final paper: Students will answer a series of questions based on topics discussed in class regarding a chemical of their choice. Grading criteria will reflect the learning objectives and include both academic rigor and creativity. Details will be provided before the end of the term, and a rubric will be provided.

SCHEDULE OF TOPICS

Week 1: Intro to chemistry

Week 2: Thermodynamics and equilibrium

Weeks 3-5: Partitioning

Week 6: Sorption

Week 7: Transport

Weeks 8-9: Transformation

Week 10: Exposure

COURSE POLICIES

Academic Integrity

Students in this course are expected to comply with the policies found in the booklet, "Academic Integrity at Northwestern University: A Basic Guide." All papers submitted for credit in this course must be sent through Canvas. Your written work may be electronically tested for plagiarized content. For details regarding academic integrity at Northwestern, visit: <http://www.northwestern.edu/uacc/>.

AccessibleNU

In compliance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act, Northwestern University is committed to providing equal access to all programming. Any student requesting accommodations related to a disability or other condition is required to register with AccessibleNU (847-467-5530) and provide professors with an accommodation notification from AccessibleNU, preferably within the first two weeks of class. All information will remain confidential.