

# Environmental Pollution

## COURSE OUTLINE

H. Alex Chen

### What Will I Learn?

#### The Module:

This module provides an overview of contaminants in the environment through scientific, legislative, and industrial-driven approaches. It will provide an in-depth discussion about the source, properties, fate, and transport of environmental contaminants and the effect it has on biota. It will address historical incidents that led to environmental legislations such as the Superfund Act (CERCLA) and the Clean Water Act. Emerging contaminants such as microplastics will be covered. Students will also have the opportunity to virtually investigate hazardous waste sites. Modern remediation technologies will be introduced if time allows.

#### Learning Outcomes:

- LO.1** Identify and describe the properties and behavior of contaminants in the environment.
- LO.2** Describe the source and historical/current use of common contaminants.
- LO.3** Explain the legislative history and the role of governance in environmental health.
- LO.4** Apply quantitative skills in environmental problem solving.
- LO.5** Predict the presence and fate of contaminants and assess their associated risks.

### How Will I Learn?

#### Sessions:

Lecture and Interactive Activities: 1 hour/week for 3 weeks.

Autonomous learning: links/resources of interesting topics will be provided. But there is no obligation to complete them. (i.e. there is no out-of-class learning required)

#### Instructor(s):

H. Alex Chen                      Email: S14540-teachers@esp.mit.edu

### Am I Eligible to Take This Module?

#### Prerequisites:

None. Basic chemistry and algebra I can be helpful.

### Who Might Be Interested in this Module?

This module might be interesting if you enjoy:

- a subject/discipline of study, such as geology/earth sciences, chemistry, or law
- learning about human impact in the environment
- investigating environmental issues/risks

## **SCHEDULE**

\*\*\*subject to change\*\*\*

### **Week 1**

- 1- Microplastics: an emerging problem
- 2- Introduction to the Course
- 3- Environmental Law: an overview
- 4- Environmental Liability

### **Week 2**

- 5- Subsurface Geology
- 6- Common contaminants and their properties
- 7- Contaminants to drinking water
- 8- Sampling and analysis of contaminants

### **Week 3**

- 9- Phase I Environmental Site Assessment
  - a. History
  - b. Rationale
  - c. Site history
  - d. Reconnaissance
  - e. Recognizable environmental condition (REC)
  - f. Phase II recommendations
- 10- Phytoremediation (if time allows)

## **EXPECTATIONS**

- Attend classes
- Treat others with respect
- Participate actively
  - Please feel free to use the chat function on Zoom.
  - You are also welcome to unmute yourself for any question.