

Syllabus

CE 2385 - Environmental Engineering Fundamentals

Fall 2019 (Aug 26, 2019 - Dec 06, 2019)

Tuesday & Thursday at 7:30 AM to 8:50 AM.

Instructor: Saurav Kumar, skumar2@utep.edu

Course Description:

The course is designed to be a survey of various areas that broadly fall under the umbrella of environmental engineering. Many of the topics taught are covered in much more detail in other courses, such as water and wastewater engineering, hydraulic and hydraulic structures, air pollution control, and solid waste management.

For successful completion of this course, I expect the students to be able to understand persistent and emerging environmental issues and have a sound understanding of material balance including being able to solve problems that involve material balance. Further, students after completion of this course should be able to understand basic considerations in water resources management, water pollution control, water treatment and reclamation, air pollution sources and controls, and solid waste management.

Textbook:

Introduction to Environmental Engineering and Science, 3rd edition. Gilbert M. Masters, and Wendell P. Ela.

Course objectives and learning outcomes:

After completing the course, students should be able to:

- Define and describe the role of Environmental Engineers in identifying and solving problems related to the human interaction with the environment (including regulations development).
- Assess the impact of human activity on the environment (e.g. risk assessment).
- Explain the main concepts and principles that are used to understand and analyze problems related to Environmental and Water Resources Engineering (e.g. mass and energy balances, risk assessment, transport processes, water resources, design parameters, etc.).
- Apply scientific and engineering principles for the quantitative analysis of environmental systems (e.g. environmental sampling design and data analysis).
- Design processes and operations aimed to decrease the effects of pollution in air, water and land systems.
- Illustrate the impact of engineered systems on the environment and apply current engineering technologies to protect the environment (water, air and soil).
- Begin synthesizing and developing solutions to more complex environmental problems.

Method of instruction and evaluation:

- Every lecture will have two or three sections. After each section, we will try to have an in-class quiz. A **laptop is required** to participate in these quizzes.
- In-class quizzes will count towards **30%** of your final grade. From all the quizzes in the semester, one-quarter of the quizzes with low-scores will not be considered for your final grade. Do not worry too much if you have to miss some, 25% of low scores will be dropped.
- Most homework will be reading assignments of course text, news articles, and research papers. Successful completion of these tasks will be necessary for some of the quizzes.
- Students, in groups (assigned later), will be required to research one chosen topic of current environmental concern. **Individually every student will also prepare a summary paper.** The paper will count towards **10%** of your grade. The group discussion should be on BlackBoard.
- Two mid-Terms will count towards **30%** of the grade (15% each).
- The final exam will count towards **30%** of the grade. This final exam will be limited to all the topics covered in the class.

Topics covered:

Topic	Class Reference
Introduction to environmental engineering	-
Mass balance	Sections 1.1-1.3
Environmental Chemistry	Sections 2.1-2.4
Risk Assessment	Chapter 4
Surface water pollution	Sections 5.1-5.7
Non-point pollution	Handouts
Groundwater	Sections 5.8-5.17
Municipal water treatment	Handouts
Municipal water reclamation	Handouts
Air pollution	Sections 7.1-7.12
Climate change	Handouts
Solid waste management	Sections 9.1-9.14

Final Grades:

Final Average, %	Course Grade
≥80 -----	A
70-80 -----	B
60-69 -----	C
50-59 -----	D
< 50 -----	F