

1. CEE 3413 – Environmental Engineering
2. Course credit hours: 3
Contact hours per week: 3
Credit category: Engineering Topics
3. Course coordinator: Julia B. Avera
4. Textbook: Mines, Jr., R.O., Environmental Engineering: Principles and Practice, Wiley Blackwell Publications, 2014

5. Course information:

2020 Catalog description	Fundamentals of environmental engineering with applications in water quality, water and wastewater treatment, solid waste management, air pollution and hazardous waste management.
Prerequisite(s)	CHEM 1110 and MATH 2110
Course type	Required

6. Course instructional outcomes:

Course Outcome No.	Course Outcome (CO)	ABET Student Outcome
CO1	Explain the major environmental regulations of the United States	2, 4
CO2	Calculate parameters related to complete mix flow, plug flow and batch reactors	1, 2
CO3	Calculate parameters related to water and waste water treatment processes	1, 2
CO4	Calculate DO concentrations in rivers	1, 2, 4
CO5	Calculate air pollutant transport	1, 2, 4
CO6	Explain how solid and hazardous waste are handled	1, 2, 4

ABET criterion 3 Student Outcomes addressed by this course:

SO No.	Student Outcome (SO)
3.1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
3.2	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3.4	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

7. Course topics:

1. Overview, environmental regulations and units (7%)
2. Reactor theory, material balances and energy balances (17%)

3. Water chemistry (5%)
4. Water treatment (26%)
5. Water quality engineering (14%)
6. Wastewater engineering (21%)
7. Air quality and pollution control (5%)
8. Solid and hazardous waste engineering (5%)

Program criteria (curriculum) addressed by this course:

1. Apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, and at least one additional area of basic science
 2. Analyze and solve problems in at least four technical areas appropriate to civil engineering
8. Additional topics, assignments, or requirements for dual-level (4000/5000) course:
N/A
9. Date: 07/15/2020