

## CIVE 3331 Environmental Engineering

CIVE 3331 - ENVIRONMENTAL ENGINEERING  
Spring 2003

2002 Catalog Data: CIVE 3331: Environmental Engineering Cr.3. (3-0). Prerequisites: CHEM 1112,1332. Introduction to air, water, and environmental pollutants, and concepts of design for treatment.

Instructor: Theodore G. Cleveland, Ph. D., P. E., Associate Professor

Required Text: "Introduction to Environmental Engineering and Science" 2nd Edition. G.M. Masters. 1996. Prentice-Hall, Upper Saddle River, New Jersey. 651p.

Prerequisites by Topic:

- 1) General Chemistry
- 2) Calculus
- 3) Computers in Engineering

Course Objectives<sup>1</sup>:

- Objective 1: To teach students about current issues in environmental engineering (1, 4, 5, 6, 7, and 8)
- Objective 2: To teach students concepts used in treatment and mitigation of pollutants (1, 2, 4, 5, 6 and 8).
- Objective 3: To teach students fundamental problem solving and design concepts used in environmental engineering. (1, 2, and 7).

Topics:

1. Introduction; Licensing of engineers; history; policy; legislation. (1 weeks).
2. Water, air, and pollutants. (1 weeks).
3. Transformation processes; stoichiometry; equilibrium; kinetics; partitioning; reactions (2 weeks).
4. Transport phenomenon; mass flux; particle motion; interfacial mass transfer; transport in porous media; reactor models; general material balances (3 weeks).
5. Water quality engineering; oxygen demand; prevention measures; treatment (3 weeks).
6. Air quality engineering; sources; control; treatment; air quality models. (3 weeks).
7. Solid and hazardous wastes; storage; resource recovery (2 week).

Evaluation: 1. Exercises; 2. Examinations; 3. Class participation.

---

<sup>1</sup> Numbers in parenthesis refer to the Department of Civil and Environmental Engineering goals.

<sup>2</sup> Letters in parenthesis refer to the ABET EC 2000 outcomes assessment items (Criterion 3).

## CIVE 3331 Environmental Engineering

Performance Criteria<sup>2</sup>:

## Objective 1.

- 1.1 Students will demonstrate the ability to use the world-wide-web, state depository libraries and federal depository libraries to find legislation and technical guidance documents relevant to environmental engineering (a, b, c, e, g, h, k).
- 1.2 Students will demonstrate the ability to write critical essays on selected environmental issues using persuasive communication techniques (b, d, h, j, k).

## Objective 2.

- 2.1 Students will demonstrate the ability to select treatment techniques to address environmental pollutants (a, b, c, e, h, k).
- 2.2 Students will demonstrate the ability to conceptually design a treatment scheme for various environmental pollutants (a, b, c, e, h, k).
- 2.3 Students will demonstrate the ability to calculate risk for selected environmental pollutants.

## Objective 3.

- 3.1 Students will demonstrate the ability to apply the concept of materials balance equations in analysis of various environmental engineering problems (a, b, c, d, e, g, h, i, j, k).
- 3.2 Students will demonstrate the ability to analyze data to support engineering decisions (a, b, c, d, e, g, h, i, j, k).

## Document History:

<u>Author</u>	<u>Action</u>	<u>Date</u>	<u>Archive File Name</u>
Theodore G. Cleveland	Created	August 23, 2000	CIVE3331_Syllabus_08_23_00.PDF
Theodore G. Cleveland	Modification #1	January 15, 2002	CIVE3331_Syllabus_01_15_02.PDF
Theodore G. Cleveland	Modification #2	December 28,2002	CIVE3331_Syllabus_ABET.PDF