

## CIVE 3331 Environmental Engineering

## CIVE 3331 - ENVIRONMENTAL ENGINEERING

2003 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 and how to find regulatory, policy, and mitigation information using internet, library, and popular media sources. (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_2000_0823.PDF
Theodore G. Cleveland	Revision #1	January 15, 2002	CIVE3331_Syllabus_2002_0115.PDF
Theodore G. Cleveland	Revision #2	December 28,2002	CIVE3331_Syllabus_2002_1228.PDF
Theodore G. Cleveland	Revision #3	January 16, 2004	CIVE3331_Syllabus_2004_0115.PDF
Theodore G. Cleveland	Revision #4	January 19, 2005	CIVE3331_Syllabus_2005_0119.PDF