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[1]:

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.

[1] Numbers in parenthesis refer to the Department of Civil and Environmental Engineering goals.
[2] Letters in parenthesis refer to the ABET EC 2000 outcomes assessment items (Criterion 3).

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Performance Criteria[2]:

Objective 1.

1.1 Students will demonstrate the ability to use the world-wide-web, state depository libraries and federal depositary 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).

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