

Tennessee Technological University
Department of Civil & Environmental Engineering
CEE 3410 – Water Supply and Pollution Control
Required
Fall Semester 2007, Spring Semester 2008

- 2007 Catalog Data: CEE 3410. Water Supply and Pollution Control. Lecture 3. Lab 2. Credit 4. Fundamental principles of water and wastewater treatment. Prerequisites: CHEM 1120, MATH 2110.
- Textbook: Davis, M.L. and D.A. Cornwell, Introduction to Environmental Engineering, Fourth Edition, McGraw Hill, 2008, Laboratory Handouts
- Reference: *Standard Methods for the Examination of Water and Wastewater*, 19th edition, WPCF, 1995.
- Coordinator: L.J. Weathers, Associate Professor of Civil Engineering
- Goal: The goal of CEE 3410 “Water Supply and Pollution Control” is to introduce the students to the fundamental principles used in environmental engineering.

Course learning objectives:

1. The student is to learn the history of environmental regulations in the United States.
2. The student is to learn the standard environmental quality parameters.
3. The students is to utilize the information of the course to analyze and/or design processes that occur in natural or engineered environment systems.

Course measurable outcomes:

Students will be expected to:

1. list the major environmental regulations of the United States;
2. know what environmental parameters are used for specific environmental systems and how these parameters are determined;
3. know the major unit processes used in water and wastewater treatment;
4. know the basic approach to the design of water and wastewater treatment processes;
5. know how solid and hazardous waste are disposed; and
6. know the cause of air pollution and some of the major air treatment processes.

Topics covered: (Three lecture classes per week, 55 minutes each; one lab per week, 2 hours each)

1. Philosophy of environmental engineering (2 classes)
2. Environmental quality (2 classes)
3. Water and waste volumes (2 classes)
4. Water quality (3 classes)
5. Potable water treatment system design (3 classes)
6. Physical treatment process design (3 classes)
7. Chemical treatment process design (5 classes)
8. Design of water treatment sludge disposal (2 classes)
9. Chemical recovery (1 class)
10. Wastewater treatment design (4 classes)
11. Physical treatment systems design (4 classes)
12. Biological treatment design (6 classes)
13. Tests (5 classes)

Contribution of the course to meeting professional component:

This course is a part of engineering topics of the curriculum, and it includes a laboratory.

ABET category content as estimated by faculty member who prepared this course description:

Engineering Science: 3.0 credits or 75%
Engineering Design: 1.0 credits or 25%

Relation of course to program outcomes:

- Outcome 1: The graduates will have a broad understanding of the relevant principles of mathematics, science, and engineering.
- Outcome 2: The graduates will have a general comprehension of four technical areas appropriate to civil engineering.
- Outcome 4: The graduates will be capable of design activities and have the ability to identify, formulate, and solve civil engineering problems.
- Outcome 5: The graduates will have effective communication skills.
- Outcome 7: The graduates will have an understanding of experimental processes.
- Outcome 8: The graduates will have the ability to use techniques, skills, and modern engineering tools needed for engineering practice.
- Outcome 11: The graduates will have an understanding of the importance of fundamental and applied research in the advancement of engineering knowledge.

Relation of course to ABET Criteria:

General Criteria

Bloom's Level of Achievement

(3a)	Knowledge of math, science and engineering	3
(3b)	Design, conduct experiments; analyze and interpret data	4
(3c)	Design a system, component, or process	3
(3e)	Identify, formulate, and solve engineering problems	3
(3g)	Effective communication	3
(3i)	Need for life-long learning	2
(3k)	Techniques, skills, modern engineering tools for engineering practice	3

Program Criteria

Bloom's Level of Achievement

1.	Apply knowledge of math and sciences	3
2.	Apply knowledge of four technical areas appropriate to civil engineering	3
3.	Conduct civil engineering experiments and analyze and interpret the resulting data	4
4.	Design a system, component, or process in more than one civil engineering context	4
5.	Explain basic concepts in management, business, public policy, and leadership	2

Computer usage: Some

Laboratory projects:

1. Introduction (1 week)
2. Physical water quality labs (3 weeks)
3. Chemical treatment (3 weeks)
4. Microbiology of water (2 weeks)
5. Water characteristics (3 weeks)
6. Field trip (1 week)
7. Test (1 week)

Prepared by: L.J. Weathers

Date: October 2007