

**Industrial & Advanced Wastewater Treatment
CE 744/ CRN 16289**

**Xinchao Wei, Ph.D., P.E.
Spring 2009**

Lecture Day/Time/Room	Tuesday & Thursday/9:30 – 10:45/ESB G84
Final Exam Date and Time	11:00AM- 1:00PM, Monday, May 4, 2009
Office	ESB-647
Phone	(304) 293-3031 x 2625
Office Hours	Tuesday & Thursday 11:00 - 12:00
Email	Xinchao.Wei@mail.wvu.edu

Objectives

Students with diverse scientific backgrounds will apply fundamental principles of physical, chemical, and biological treatment to industrial wastes and will become versed in the application of such technologies in a broad cross-section of industries through in class lectures, exercises, and homework. Students will form groups and will: (1) conduct independent research on the management of wastewaters in an industry selected by the students (2) prepare a written technical document (term paper) and (3) make an oral presentation of their findings in class. Thus, students will gain experience not only in technical problems solving, but also in: (1) research methodologies, (2) scientific/technical writing, (3) the development of effective oral presentation skills, and (4) the necessity of working as part of a team of scientists to understand the wide scope of problems facing practitioners in the field of industrial waste treatment.

Texts

No textbooks are required. However, the following references are recommended for supplementary reading:

1. Eckenfelder (2000). Industrial Water Pollution Control, 3rd ed., McGraw-Hill Companies, New York, NY.
2. Sell (1992). Industrial Pollution Control, 2nd ed., Van Nostrand Reinhold, NY.
3. LaGrega, Buckingham, and Evans (2003). Hazardous Waste Management, 3rd ed., McGraw-Hill Companies, New York, NY.
4. Metcalf and Eddy (2003). Wastewater Engineering: Treatment, Disposal, and Reuse 4th ed., McGraw Hill, NY.

Supplementary Materials

In my opinion, there are no texts available which (1) fully cover both treatment technologies and applications and (2) are written at a level appropriate for this course. To supplement the lack of appropriate materials oriented toward treatment technologies, the instructor will prepare and disseminate notes which cover the principle theories underlying the greater understanding of the application of treatment technologies to industrial wastes. Additionally, the instructor will introduce material of relevance on current technologies and applications from current scientific and engineering literature.

Class Policies

Statement on Academic Honesty

Any student who misrepresents the work of others as his or her own will receive an “F”

for the semester and will be referred to the appropriate Chairperson and/or Dean for disciplinary action.

Lecture

The instructor will present material in lecture under the assumption that students have read the indicated text and any supplementary materials *prior to class*. Attendance will not be formally monitored during lecture periods. However, attendance and class participation will be considered in the evaluation of a student’s desire to learn. Students are expected to arrive on time for lecture. Late arrival to class is a distraction to both the instructor and students. Cell phones, pagers, and the like are to be shut off during lecture as a courtesy to the instructor and fellow students. Supplementary materials will be handed out during lecture. Any student who did not receive handouts due to his or her absence from class should meet with Dr. Wei during office hours to obtain the supplements.

Grading

Exam 1	30%
Exam 2	30%
Homework	10%
Term paper/project*	30%

* 70% written and 30% oral.

Tentative course outline

(Subject to change at the discretion of the instructor)

Week	Topic
1	Industrial wastewater treatment: overview.
2	Pre- and primary treatment of industrial wastewater.
3	Coagulation and heavy metals removal.
4	Aeration and chemical oxidation.
5	Removal of organic pollutants from industrial wastewater.
6	Adsorption processes for industrial wastewater.
7	Ion exchange for industrial wastewater.
8	Exam 1
9	Sludge handling and disposal.
10	Spring Break
11	Miscellaneous treatment processes.
12	Textile and food industry.
13	Metal industry-iron and steel and nonferrous metal production.
14	Pulp and paper industry.
15	Chemical industry-raw materials.
16	Student presentations.
17	Exam 2 (Final)

Note: The terms and conditions set forth in this syllabus are subject to change at the discretion of the instructor.