

CENG 4710 Environmental Control

Instructor: Prof. Xijun Hu (Rm 4559, Tel: 2358 7134)

Assessments:

Assignments:	20%
2 Quiz	10% each
Final Exam:	60%

Textbook:

M.D. LaGrega, P.L. Buckingham, and J.C. Evans, “*Hazardous Waste Management*”, 2nd ed., McGraw-Hill, New York, 2001.

Course Objectives:

- Recognize the necessity for managing the environment for sustainable development
- Understand that pollution prevention is the most important aspect of environmental control
- Learn to use appropriate measures for pollution prevention
- Learn to use appropriate methods for the control of emissions into the atmospheric environment
- Learn to use appropriate methods for the control of wastes emitted into the aquatic environment
- Learn to use appropriate methods for the control of solid wastes and hazardous wastes
- Become confident for an interview with an environmental consulting firm or EPDHK

Intended Learning Outcomes (ILO)

Be able

- to identify the available resources in the ecosystems
- to identify the impact of human activities on the ecosystems
- to identify the need for prudent management of the ecosystems' resources to attain sustainable development
- to plan for pollution prevention as the first and foremost measure for environmental control
- to apply chemical engineering principles in solving environmental problems
- to identify the types and sources of solid wastes
- to employ physical, chemical, catalytic, biological and thermal methods for the treatment of solid wastes
- to use appropriate methods for the treatment of hazardous wastes
- to identify the types and sources of pollutants emitted into the atmospheric environment
- to employ physical, chemical, catalytic, thermal and biological methods for the treatment of air emission
- to identify the types and sources of waste water
- to employ physical, chemical, catalytic and biological methods for the treatment of wastewater
- to perform a preliminary design for the incineration of Municipal Solid Waste (MSW) in Hong Kong

Lecture Outlines

Week	Contents
	Pollution and Society
1	Environmental systems. Environmental awareness

	and government regulations with emphasis on the situation of Hong Kong
1	Classification of Pollutants and Selection of Treatment Technologies
2	Pollution Prevention
	Treatment Methods
	<i><u>Physical processes</u></i>
2,3	Air Stripping
4-7	Adsorption, Quiz 1
	<i><u>Chemical processes</u></i>
8,9	Chemical Oxidation, Supercritical Fluids
10-11	Wet Air Oxidation, Quiz 2
	<i><u>Biological Methods</u></i>
12,13	Basic Microbiology; Engineering Factors; Growth Kinetics
13	Activated Sludge Process Design