

THE PENNSYLVANIA STATE UNIVERSITY
Department of Civil & Environmental Engineering

CE 575

Detailed Outline Industrial Waste Management

November 1, 2006

Spring 2007

Course Synopsis

Instructor: R.W. Regan

Required textbook Hazardous Waste Management, authors Lagrega /Buckingham/Evans (2002)

Textbook used for reference: Pollution Prevention: Fundamentals and Practice, author-Paul L. Bishop (TD897.B49 2000)

Part I (7 classes) – Introduction to Concept and Basic Fundamentals

- Introduction to P² (extended to P³)
- Properties and fates of environmental contaminants
- Industrial activity and the environment (specifically land based technologies)
- Process fundamentals (mass and energy balances, engineering statistics)
- Environmental regulations and sustainability issues

Part II (7 classes) – Improved Manufacturing Operations

- Traditional waste minimization
- The manufacturing process
- P² examples
- Life cycle assessment
- P² economics
- P² planning

Part III (10 classes) – Technologies for current applications

- Water, energy and reagent conservation
- Treatment methods and residual management (applications to semester project)

Part IV (6 classes) – Technologies for the clean-up of past short-sighted actions involving hazardous and toxic wastes (aka remediation).

- Remedial technologies
- Alternatives analysis
- Presentations of semester projects involving developments in environmental sustainable systems

Grade Distribution:

Exam 1	25%
Exam 2	35%
Group Project	30%
Class Participation	10%

- Proactive Class Participation 5%
- Project Presentation 5%