

Tennessee Technological University
Department of Civil & Environmental Engineering
CEE 5410/4410 – Solid and Hazardous Waste Management

2017 Catalog Data: **CEE 4410/5410. Solid and Hazardous Waste Management.** Lecture 3. Credit 3..

Required Textbook: Hazardous Waste Management, Second Edition, LaGrega, Buckingham and Evans,, Waveland Press, Inc., Long Grove, Illinois (2001).

Faculty Coordinator: Kevin S. Young, P.E., B.C.E.E.

Prerequisites: CEE 3413 or consent of instructor. The collection and disposal of solid wastes. Treatment and disposal technologies of hazardous wastes.

Goal: To introduce students to the laws and regulations governing the storage, transportation and disposal of solid and hazardous wastes; to the mechanisms generating solid waste and to the basic principles of solid waste collection and disposal; and to management practices, treatment methods and remediation of contaminated sites associated with hazardous wastes.

Course learning objectives:

Students will be exposed to topics in a manner that will allow them to apply concepts and principles to solve straightforward problems in the civil engineering technical area referred to as environmental/sanitary engineering.

Major Topics Covered:

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| 1. Laws and regulations governing municipal solid waste management & hazardous waste management | 8. Evolution of hazardous waste management and public perception of risk |
| 2. Sources, types and composition of municipal solid waste; types of material recovered from municipal solid waste | 9. Hazardous waste classification |
| 3. Physical, chemical and biological properties of municipal solid waste | 10. Overview of organic & physical chemistry & groundwater hydrology |
| 4. Solid waste generation and collection rates; methods for solid waste collection | 11. Fate and transport of hazardous wastes in the environment |
| 5. Separation, processing and recycling solid waste | 12. Toxicology |
| 6. Solid waste transfer and transportation | 13. Environmental audits; environmental justice |
| 7. Landfill method of solid waste disposal | 14. Hazardous waste stabilization and treatment techniques |
| | 15. Risk assessment |
| | 16. Hazardous waste site remediation |

Measurable outcomes:

Students will be expected to:

1. Report the basic tenets of the rules and laws governing municipal solid waste in Tennessee;
2. Relate the sources, types, composition and properties of municipal solid wastes;
3. Relate the methods for collecting, processing and transporting municipal solid wastes;
4. Relate the components and methodology for the design of municipal solid wastes landfills;
5. Report the basic tenets of the rules and laws governing hazardous waste in Tennessee;
6. Relate the basic fates and transport mechanisms for hazardous wastes in the environment;
7. Describe toxicology and environmental audits;
8. Relate the basic characteristics of hazardous waste stabilization and treatment methods; and
9. Describe the process of the remediation of hazardous waste sites.