

CE 322: Solid Waste Management (3-0-0:3)

Course objectives: The objective is to make the students understand the components of a comprehensive solid waste management system including collection, storage, transportation, processing, and ultimately disposal.

Solid Waste introduction

Origin, types, generation rates and composition; physical, chemical, biological and thermal characteristics.

Solid Waste Management System

Collection, Storage, segregation, reuse and recycling possibilities, Transportation, Treatment / processing, final disposal.

Separation and transformation/treatment of solid waste

Material separation and processing technologies; biological treatment techniques: conventional composting, vermi-composting, mechanical composting & anaerobic digestion; thermal treatment techniques: incineration, pyrolysis and gasification systems, solid residue management.

Final Disposal Techniques

Landfill classification, types and methods, landfill siting consideration, characteristics, collection and use of landfill gas; composition, collection and treatment of leachate, Landfill design - an Overview.

Municipal Solid Waste (MSW) Management

Collection & storage of MSW, transportation of MSW with route optimization techniques, transfer stations, recycling and recovery, treatment options for MSW, Refuse Derived Fuel (RDF) production, disposal options: dry tomb and bioreactor landfills, Rules and regulations for MSW management

.Biomedical Waste (BMW) Management

Collection & storage of BMW, treatment options for BMW, Rules and regulations for BMW management.

Text Books:

1. Tchhobanoglous, G., Theisen and Vigil, "Solid Waste Management: Engineering Principles and Management issues", McGraw Hill.
2. Vesilind, P. A., Worrell, W. A. and Reinhart, D. R., "Solid Waste Engineering", Thomson Brooks/Cole.
3. Wentz, C. A., "Hazardous Waste Management", McGraw Hill.
4. Peavy, H. S., Rowe, D. R. and Tchhobanoglous, G., "Environmental Engineering", McGraw Hill International Ed.

References:

1. John Pichtel, "Waste Management Practices: Municipal, Hazardous and Industria", CRC Press, Taylor and Francis Group.
2. LaGrega, M.D. Buckingham, P.L. and Evans, J.C., "Hazardous Waste Management", McGraw Hill.
3. Manual on municipal solid waste management. Central Public Health and Environmental Engineering Organization, CPHEEO, New Delhi. <http://www.indiawaterportal.org/articles/manual-municipal-solid-waste-management-cpheeo-moud>
4. Richard J. Watts, "Hazardous Wastes - Sources, Pathways, Receptors", John Wiley and Sons, New York.

Expected outcome: The new Solid waste handling Rules has opened up lots of employment opportunities in Government as well as private sector.
