Course Number and Name
BCE056 - SOLID AND HAZARDOUS WASTE MANAGEMENT

Credits and Contact Hours
3 & 45

Course Coordinator's Name
Dr.A.Mani

Text Books and References

REFERENCES:

- George Tchobanoglous, Hilary Theisen and Samuel A, Vigil "Integrated Solid Waste Management, McGraw- Hill International edition, New York, 1993.
- CPHEEO "Manual on Municipal Solid waste management, Central Public Health and Environmental Engineering Organisation, Government of India, New Delhi, 2000.
- Micheael D. Lagrega, Philip L Buckingham, Jeffrey C. E vans and Environmental Resources Management, Hazardous waste Management, McGraw- Hill International edition, New york, 2001.
- Vesilind P.A., Worrell W and Reinhart, Solid Waste Engineering, Thomson Learning Inc., Singapore, 2002.

Course Description

- To educate the students on the principles involved in the management of municipal solid waste and hazardous wastes- from source identification up to disposal.

Prerequisites	Co-requisites
Environmental Engineering	NIL

required, elective, or selected elective (as per Table 5-1)

Course Outcomes (COs)	
CO1	To make them understand the fundamentals of solid and hazardous wastes and also the types, need and sources of solid and hazardous wastes.
CO2	To understand about the methods of waste characterization and source reduction and to study the various methods of generation of wastes.
CO3	To understand in detail about the storage, collection and transport of wastes. and also to study about the methods used for handling and segregation of wastes.
CO4	To improve the knowledge on the waste processing techniques which includes incineration, solidification and stabilization of hazardous wastes
CO5	To know about the basics of the waste disposal options and also a detailed study on the disposal in landfills and also to learn about landfill remediation

Student Outcomes (SOs) from Criterion 3 covered by this Course

COs/SOs	a	b	c	d	e	f	g	h	i	j	k
CO1	H				H				M		
CO2	H			M					H		
CO3			M			H					

CO4	H					H		L		
CO5		M			H			H		

List of Topics Covered

UNIT I   INTRODUCTION   9

Types and Sources of solid and hazardous wastes-Need for solid and hazardous waste management-Elements of integrated waste management and roles of stakeholders- Salient features of Indian legislations on management and handling of municipal solid wastes, hazardous wastes, biomedical wastes, lead acid batteries, plastics and fly ash,financing waste management.

UNIT II   WASTE CHARACTERIZATION AND SOURCE REDUCTION   9

Waste generation rates and variation-Composition, physical, chemical and biological properties of solid wastes- Hazardous Characteristics- TCLP tests- waste sampling and characterization plan- source reduction of wastes- Recycling and reuse- waste exchange.

UNIT III   STORAGE, COLLECTION AND TRANSPORT OF WASTES   9

Handling and segregation of wastes at source- storage and collection of municipal solid wastes- Analysis of collection systems- Need for transfer and transport- Transfer stations Optimizing Waste allocation-compatibility, storage, labeling and handling of hazardous wastes- hazardous waste manifests and transport.

UNIT IV   WASTE PROCESSING TECHNIQUES   9

Objectives of waste processing- material separation and processing technologies- biological and chemical conversion technologies-method and controls of composting- thermal conversion technologies and energy recovery- incineration- solidification and stabilization of hazardous wastes- treatment of biomedical wastes.

UNIT V   WASTE DISPOSAL   9

Waste disposal options- Disposal in landfills- Landfill Classification, types and methods- site selection-design and operation of sanitary landfills, secure landfills and landfill bioreactors- leachate and landfill gas management- landfill closure and environmental monitoring- closure of landfills- landfill remediation.