

SOLID WASTE MANAGEMENT (Open Elective-II)**B. Tech. IV Year I Sem**

Course Code	Category	Hours/Week			Credits	Maximum Marks		
		L	T	P		CIE	SEE	TOTAL
23CE716	Open Elective	3	0	0	3	40	60	100
Contact Classes: 48	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 48			

Course Outcomes: At the end of the course the student will able to:

- Identify the physical and chemical composition of solid wastes.
- Analyze the functional elements for solid waste management.
- Understand the techniques and methods used in transformation, conservation, and recovery of materials from solid wastes.
- Identify and design waste disposal systems.

UNIT - I Solid Waste: Definitions, Types of solid wastes, sources of solid wastes, Characteristics, and perspectives; properties of solid wastes, Sampling of Solid wastes, Elements of solid waste management - Integrated solid waste management, Solid Waste Management Rules 2016.

UNIT - II Engineering Systems for Solid Waste Management: Solid waste generation; on-site handling, storage and processing; collection of solid wastes; Stationary container system and Hauled container systems – Route planning - transfer and transport; processing techniques.

UNIT - III Engineering Systems for Resource and Energy Recovery: Processing techniques; materials recovery systems; recovery of biological conversion products – Composting, pre and post processing, types of composting, Critical parameters, Problems with composing - recovery of thermal conversion products; Pyrolysis, Gasification, RDF - recovery of energy from conversion products; materials and energy recovery systems.

UNIT - IV Landfills: Evolution of landfills – Types and Construction of landfills – Design considerations – Life of landfills- Landfill Problems – Lining of landfills – Types of liners – Leachate pollution and control – Monitoring landfills – Landfills reclamation.

UNIT - V Hazardous waste Management: Sources and characteristics, Effects on environment, Risk assessment – Disposal of hazardous wastes – Secured landfills, incineration - Monitoring – Biomedical waste disposal, E-waste management, Nuclear Wastes, Industrial waste Management.

TEXT BOOKS:

1. Tchobanoglous G, Theisen H and Vigil SA 'Integrated Solid Waste Management,
2. Engineering Principles and Management Issues' McGraw-Hill, 1993.
3. Vesilind PA, Worrell W and Reinhart D, 'Solid Waste Engineering' Brooks/Cole Thomson Learning Inc., 2002.

REFERENCE BOOKS:

1. Peavy, H.S, Rowe, D.R., and G. Tchobanoglous, 'Environmental Engineering', McGraw Hill Inc., New York, 1985.
2. Qian X, Koerner RM and Gray DH, 'Geotechnical Aspects of Landfill Design and Construction' Prentice Hall, 2002.

