

Year & Sem	Course Code: CE4606	Course Name: <b>Solid and Hazardous Waste Management</b>	No. of Credits: 4	L	T&PS	P
				2	2	0

#### **UNIT- I: Relevant Regulations**

Municipal solid waste (management and handling) rules; hazardous waste (management and handling) rules; biomedical waste handling rules; flyash rules; recycled plastics usage rules; batteries (management and handling) rules

#### **UNIT -II: Municipal Solid Waste Management – Fundamentals**

Sources; composition; generation rates; collection of waste; separation, transfer and transport of waste; treatment and disposal options

#### **UNIT-III: Hazardous Waste Management – Fundamentals**

Characterization of waste; compatibility and flammability of chemicals; fate and transport of chemicals; health effects

#### **UNIT- IV: Physicochemical Treatment of Solid and Hazardous Waste**

Chemical treatment processes for MSW (combustion, stabilization and solidification of hazardous wastes); physicochemical processes for hazardous wastes (soil vapor extraction, air stripping, chemical oxidation); ground water contamination and remediation

#### **UNIT - V:Biological Treatment of Solid and Hazardous Waste**

Composting; bioreactors; anaerobic decomposition of solid waste; principles of biodegradation of toxic waste; inhibition; co-metabolism; oxidative and reductive processes; slurry phase bioreactor; in-situ remediation

#### **UNIT VI: Landfill design**

Landfill design for solid and hazardous wastes; leachate collection and removal; landfill covers; incineration.

#### **References/Text Books:**

1. Vesilind P.A., Worrell W. and Reinhart D.R., "Solid Waste Engineering", Thomson Books.
2. Bhide A.D. and Sundaresan B.B., "Solid Waste Management, Collection, Processing and Disposal", Nagpur.
3. Pichtel, John. Waste Management Practices: Municipal, Hazardous and Industrial. CRC Press, Taylor and Francis Group, 2005.
4. LaGrega, Michael D., Buckingham, Philip L. and Evans, Jeffrey C. Hazardous Waste Management. Waveland Press Inc., Reissue Edition, 2010.

**Lecture Plan:** Unit-I & -II syllabus for MID-I, Unit-III & -IV syllabus for MID-II and Unit-V & -VI syllabus for MID-III examinations.

#### **Video Lectures (Web Links):**

1. <http://nptel.ac.in/courses/105106056/>