

Branch Name:	Civil Engineering
Semester/Year:	Semester VIII / Fourth Year
Subject Title:	Hazardous Waste Management and Legislation (Elective - IV)
Subject Code:	1ET1060802
Pre-requisite:	An Introductory Knowledge of Solid and Hazardous Waste along with Some Basic Understanding of Solid Waste Management at Industries

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture (L)	Tutorial (T)	Practical (P)	Credit	Theory (Marks)		Practical (Marks)		Total (Marks)
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
03	02	00	05	70	30	-	-	100

Subject Contents				
Sr. No	Topic	Total Hours	Weightage (%)	
1	Introduction and characterization of solid waste and hazardous waste: Municipal waste, Plastic waste, Biomedical waste, e waste, dairy wastes, agricultural wastes, slaughter house wastes, industrial waste and hazardous waste.	10	25%	
2	Legislation for management of solid waste: Municipal Solid Waste Management Rules, 2000. e-waste management and handling rules, 2011. Major sections of Hazardous Wastes (Management, Handling and Transboundary Movement) Rules, 2008.	10	25%	
3	Solid waste management/treatment: Sustainable waste management practices, 4R principle for waste management. Physico-chemical and Biological methods (aerobic composting and anaerobic digestion) of treating solid wastes. Thermo-chemical methods (Pyrolysis, gasification and incineration) of treating solid wastes. Energy recovery through refuse derived fuel. Solid waste management in industries. E-waste processing and disposal.	10	25%	
4	Solid and hazardous waste disposal: Guidelines and Landfill procedure for disposing hazardous waste. Location and Site selection criteria for hazardous waste landfill. Site investigation, planning and design of hazardous waste landfill. Waste acceptance criteria at hazardous waste landfill. Liner and cover criteria for hazardous waste landfill. Sanitary landfills for municipal waste. Other methods of disposing solid waste.	12	25%	

Course Outcome:

After learning this course the students would have:

1. Proper understanding about various kind of solid wastes and their general characteristics.
2. Awareness about existing legislation for municipal waste, e-waste and hazardous waste in India.
3. Sound knowledge of different technologies available for treatment of various solid wastes.
4. Awareness about design criteria for hazardous waste landfill.

Reference Books:

1. Industrial Water Pollution Control, Eckenfelder W.W.; McGraw Hill Book Company 3rd Ed, 2000.
2. Environmental Engineering, Kiely G. McGraw Hill Book Company, 1998.
3. Environmental Pollution Control and Engineering, Rao C.S., New Age International (P) Limited, 1991.
4. Treatment of Industrial Wastes, Bessellviere, E and Schwartz. McGraw Hill. 1975.
5. Handbook of Solid Waste Management and Waste Minimization Technologies, N P Cheremisinoff, Butterworth-Heinemann, 2003.
6. Integrated Solid waste Management, F Dougal and P White, John Wiley and Sons, 2001.
7. Solid waste Engineering, Worrell and Vesilind, Cengage Learning, 2nd Ed., 2001.

E-Resources (If any):

<http://nptel.ac.in/>