

# AMEV-26 HAZARDOUS WASTE MANAGEMENT

## OBJECTIVES:

To impart knowledge on the identification, characterization, source reduction, storage, transport, processing and safe disposal of hazardous wastes.

### UNIT I WASTE IDENTIFICATION AND CHARACTERISATION -

Hazardous waste definition - Physical and Health hazards wastes - Hazardous Waste Management and Handling Rules - Characterization of hazardous wastes - Analytical-Analytical methods -Hazardous waste inventory- Source reduction of hazardous wastes

### UNIT II STORAGE, TRANSPORT AND PROCESSING OF WASTES

Handling and storage of Hazardous wastes -Waste Compatibility Chart - Hazardous Waste Transport- Manifest system - Transboundary movement of wastes - Basal Convention - Hazardous waste treatment technologies - Physical, chemical and thermal treatment of hazardous waste - Solidification - Chemical fixation - Encapsulation - Incineration

### UNIT III SECURE LANDFILLS -

Hazardous waste landfills - Site selections - landfill design and operation - Regulatory aspects - Liner System- Cover system- Leachate Collection and Management - Environmental Monitoring System- Landfill Closure and post closure care

### UNIT IV REMEDIATION OF CONTAMINATED SITES

Contaminated sites - Site Assessment - Remediation Technologies - Onsite and off site remediation techniques - Bioremediation- Phyto remediation- Physico chemical techniques, Soil flushing - Pump and treat systems - restoration of remediated sites

### UNIT V SPECIAL HAZARDOUS WASTES -

Biomedical waste - Definition - Sources - Classification - Collection - Segregation Treatment and disposal - National Regulatory framework

Radioactive waste: Definition - Sources - Low level and high level radioactive wastes and their management - Radiation standard by ICRP and AERB.- National Regulatory framework

Electronic Wastes : Waste characteristics - Generation - Collection - Recycling and disposal-National Regulatory framework

Lead Acid Batteries : Generation, impacts and management - National Regulatory framework

## OUTCOMES:

The students completing the course will have

- an insight into the characterization of hazardous wastes and the role of different stakeholders under the national legal framework
- ability to plan minimization of hazardous wastes
- ability to design facilities for the storage, transport, processing and disposal of hazardous wastes

## TEXT BOOKS:

Hazardous waste management Charles A. Wentz. Second edition 1--5. McGraw Hill International.

Environmental Sciences by Daniel B. Botkin and Edward A. Keller, Wiley student, 6<sup>th</sup> edition- 200-.

Harry M. Freeman, Standard handbook of Hazardous waste treatment and disposal McGraw Hill 1--7.

**REFERENCES:**

- Hazardous Waste (Management and Transboundary Movement) Rules, Ministry of Environment and Forests, Government of India, New Delhi, 1-8-
- Biomedical Waste (Management and Handling) Rules, Ministry of Environment and Forests, Government of India, New Delhi, 1--8
- Electronic Waste Management and Handling Rules, Ministry of Environment and Forests, Government of India, New Delhi, 2011
- Guidelines and criteria for hazardous waste landfills and hazardous waste treatment disposal facilities, Central Pollution Control Board, New Delhi, 2010