4/4 B.Tech. SEVENTH SEMESTER

CE7T5D **SOLID WASTE MANAGEMENT** **Credits: 3**

Lecture: 3 periods/week **Internal assessment: 30 marks**

Tutorial: 1 period /week **Semester end examination: 70 marks**

Pre-requisites: Environmental engineering

Learning objectives:

- To know about Sources, types, Composition of MSW
- To learn how to handle, separate and store the solid waste at source of collection
- To know the method of transfer and transport the solid waste after the collection from the source.
- To learn how to separate, and transformation methods like Pyrolysis, compositing, Incineration, etc. Materials to be recycled from MSW

Course outcomes:

After the exposure to the subject, student is able to:

1. Comphrend Solid Waste Management program success in a city or town.
2. Exposure the different techniques of SWM
3. Assess different process techniques of solid waste
4. Classify different types of waste.
5. Analyze existing scenario of solid waste management in India

UNIT - I

SOURCES, TYPES AND COMPOSITION OF MUNCIPAL SOLID WASTE

Sources- Types- Composition of Solid Waste- Effects of improper disposal of solid waste- public health effects-Types of materials recovered from MSW.

WASTE HANDLING, SEPARATION AND STORAGE

On- site handling and separation at solid waste-on - site storage of solid waste-options under Indian conditions.

UNIT-II

COLLECTION OF MUNCIPAL SOLID WASTE

Methods of collection-equipment- types of vehicles-man power requirement-collection routes.

TRANSFER AND TRANSPORT OF MUNCIPAL SOLID WASTE

Need for Transfer operations-Transfer Stations-Selection of Location of Transfer Station-Transport means and methods.

UNIT-III

PROCESSING TECHNIQUES

Mechanical volume reduction-Thermal volume reduction- manual component separation.

DISPOSAL OF SOLID WASTE

Disposal of Solid Waste – Sanitary land Fills- Site selection- Planning-Design and operation of Sanitary landfills- Leachate collection & treatment-composition of land fill gases.

UNIT-IV

RECOVERY OF THERMAL AND BIOLOGICAL CONVERSION

Combustion of waste materials-incineration with heat recovery-gasification-pyrolysis

RECOVERY OF BIOLOGICAL CONVERSION

Composting- Anaerobic digestion

UNIT-V

PLASTIC WASTE MANAGEMENT

Dangers of Plastics- Types- pyrolosis- Recycling of Plastic waste-Disposal of plastic waste

E-WASTE MANAGEMENT

Health Hazards of E- waste-sources-components-collection-segregation-E- waste management

Learning resources:

Text books:

1. Integrated Solid waste management by Goerge Tchobanolous, Hilary Theisen & Samuel A. Vigil. McGraw Hill International Editions
2. Design of Land Fills and Integrated Solid waste management by Amalendu Bagchi , John Wiley & Sons

Reference books:

1. CPCB Manual on solid waste Management
2. Solid waste management K.sasikumar, sanoop Gopi Krishna PHI Learning (P) Ltd.
3. Solid waste management in India by Urvashi Dhamija.

e-learning resources:

NPTEL