

RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Civil Engineering, VII-Semester

Open Elective CE 703(C) Integrated Waste Management

(L-T-P: 3-0-0, Credit: 3)

Course Objectives:

- O1: To Aware about the problems associated with Municipal solid waste(MSW) and their effective management.
- O2: To understand the components of Integrated solid waste management system.
- O3: To learn about recycling, reuse and reduce, recover of solid wastes and Transfer station.
- O4: To examine the operation of a resource recovery facility, waste-to-energy strategies.
- O5: To study the design and operation of a municipal solid waste composting and land-filling.

UNIT I: INTRODUCTION OF SOLID WASTES

Definition of solid waste, garbage, rubbish-Sources and Types of solid wastes. Characteristics of Solid Wastes: Physical, chemical and biological characteristics- Problems occur due to improper disposal of solid wastes.

UNIT II: INTEGRATED SOLID WASTE MANAGEMENT

Definition- Reduction, reuse, recycling and recovery principles of waste management- Functional elements of integrated solid Waste management- Waste generation and handling at Source-Collection of solid wastes- Collection methods and services- guidelines for collection route layout.

UNIT III: INTRODUCTION OF TRANSFER STATION

Transfer Station-Processing and segregation of the solid waste- various methods of material segregation. Importance of Transfer Stations. Site selection of transfer stations.

UNIT IV: PROCESSING AND TRANSFORMATION OF SOLID WASTES

Composting: definition-methods of composting-advantages of composting, Incineration: definition-methods of incineration-advantages and disadvantages of incineration.

UNIT V: DISPOSAL OF SOLID WASTE

Volume reduction, Open dumping, land filling techniques. Landfills: Classification-Design and Operation of landfills, Land Farming, Deep well injection.

Course Outcomes:

After studying this course, students will be able to:

CO1: Review the components of solid waste management system as per need of particular locality, town or city.

CO2: Be aware of the significance of recycling, reuse and reduction and recovery of solid wastes.

CO3: Develop an insight into the collection, transfer, and transport of municipal solid waste.

CO4: Understand the importance and operation of a resource recovery facilities like waste-to-energy Technologies-Biochemical and thermochemical.

CO5: Understand the design and operation of a municipal solid waste composting and landfilling.

Text Books:

1. George Tchobanoglous, Hilary Theisen and Samuel A Vigil, Integrated Solid Waste management, Tata McGraw Hill
2. Ramachandra T.V., Management of Municipal Solid Waste, 2009; by The Energy and Resource Institute, TERI
3. Sasikumar, K, Gopi Krishna, Sanoop, Solid Waste Management; 2009, PHI.

Reference Books:

1. Manual on Solid Waste Management, prepared by The Central Public Health and Environmental Engineering Organization(CPHEEO), India
2. MSW Management Rules 2016, Govt. of India, available online at CPCB website