GEDX 135	MUNICIPAL SOLID WASTE	L	T	P	C
SDG: 3	MANAGEMENT	3	0	0	3

COURSE OBJECTIVES:

The objectives of the course are to impart knowledge on

COB1: sources, types, characteristics, and effects of improper disposal of municipal solid waste.

COB2: on-site waste segregation and storage methods

COB3: different methods employed for waste collection and transfer

COB4: various types of waste processing techniques and resource recovery

COB5: solid waste disposal methods and ISWM approach.

MODULE I INTRODUCTION TO SOLID WASTE MANAGEMENT 9

Evolution, Sources, Types and Generation of Solid Waste– Quantity – Factors affecting generation of solid wastes - Characteristics – Methods of sampling and characterization - Effects of improper disposal of solid wastes - Principle of solid waste management - Public awareness - Role of NGOs.

MODULE II ON-SITE STORAGE & HANDLING 9

Storage of household waste - Selection of storage containers: Types, materials, and capacity- Storage area design: Location, Accessibility, and Safety considerations- Labeling and color coding for waste containers- Principles of safe waste handling- Tools and equipment for waste handling.

MODULE III COLLECTION AND TRANSFER 9

Methods of collection – Primary and secondary collection - Types of vehicles – Light commercial vehicles- Four wheeled mini trucks- Skip truck - Manpower requirement – Collection routes - Transfer stations – Selection of location- Operation & maintenance.

MODULE IV OFF-SITE PROCESSING 9

Processing techniques – Mechanical volume reduction, Thermal volume reduction and Chemical volume reduction – Chemical processes- Incineration- Solidification-Neutralization and chemical precipitation- Biological Processes- Composting- anaerobic digestion and vermicomposting.

MODULE V DISPOSAL OF SOLID WASTE 9

Dumping of solid waste – effects in land and water environment- Impacts of improper disposal of plastic waste and e-waste-Training and use of personal Protective Equipment (PPE) Sanitary landfills – site selection, design and operation of sanitary landfills – Leachate collection & treatment – Integrated Solid Waste Management (ISWM) and legislation.

L – 45; TOTAL HOURS – 45

TEXT BOOKS:

1. George Tchobanoglous, Hilary Theisen, Vigil, S. A. Integrated Solid Waste Management, Engineering Principles and Management Issues, McGraw-Hill Education (India) Private Limited, 2014.
2. Ramesha Chandrappa, Diganta Bhusan Das, Solid Waste Management, Principles and Practice, Springer Berlin Heidelberg, London, 2012
3. Ramachandra, T. V. Management of Municipal Solid Waste, TERI Press, New Delhi, 2011.
4. Sasikumar, K., Sanoop Gopi Krishna, Solid Waste Management, PHI Learning, New Delhi, 2009.

REFERENCES:

1. CPHEEO, "Manual on Municipal Solid Waste Management", Central Public Health and Environmental Engineering Organisation, New Delhi, 2016.
2. Gomes, Maria Isabel, Martinho, G., Pires, A., Rodrigues, S., “Sustainable Solid Waste Collection and Management”, Springer International Publishing, Germany, 2018.
3. MSW Management Rules 2016, Govt. of India https://cpcb.nic.in/rules-2/

COURSE OUTCOMES:

At the end of the course the student will be able to

CO1: describe the different sources, types and the effects of improper disposal of municipal solid waste

CO2: explain the storage, segregation and handling of solid waste

CO3: Illustrate the methods for the collection of solid waste

CO4: identify the appropriate offsite processing techniques and resource recovery from solid waste

CO5: explain the solid waste disposal techniques and ISWM approach.

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO8	PO9	PO 10	PO1 1	PO 12	PSO 1	PSO 2	PSO3
CO1	-	-	L	-	-	L	L		-	-	-	-	-	-	L
CO2	-	-	L	-	-	L	L		-	-	-	-	-	-	L
CO3	-	-	L	-	-	L	L		-	-	-	-	-	-	L
CO4	-	-	L	-	-	L	L		-	-	-	-	-	-	L
CO5			L			L	L								L

Note: L - Low Correlation M - Medium Correlation H -High Correlation

SDG 3 Ensure healthy lives and promote well-being for all at all ages

The knowledge about the management of solid waste and implementing techniques helps to minimize their adverse impacts on human health. It will also aid in developing a sustainable environment.