

Subject Code: 1ET410605	Subject Title: Solid Waste Management
Pre-Requisite	----

RATIONALE:

Solid waste management is a pressing issue, and lack of know how in solid waste management is a great concern for all the Local Self Govt. units & community. Additionally, there is still little awareness on the importance of sound environmental management within the majority of the population. The course on Solid Waste Management gives the student an overview of municipal solid waste management including collection, transfer, transport, and disposal. Methods of processing, basic disposal facilities, disposal options, and the environmental issues of solid waste management will be covered in this course. In addition, this course provides the student with relevant information about municipal solid waste reduction and on hazardous waste management. This course is therefore an essential course for diploma program in Environmental/Civil Engineering.

COURSE OBJECTIVE:

Following are the objectives of this course:

- To know various sources of solid.
- To learn techniques of collection and transportation of solid waste.
- To know various methods of disposal of solid waste.
- To understand and identify different biomedical and E-waste and their subsequent disposal Techniques.

TEACHING AND EVALUATION SCHEME:

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)			
Lecture	Tutorial	Practical	Credit	Theory		Practical	
				University Assessment	Continuous Assessment	University Assessment	Continuous assessment
3	0	2	4	60	40	20	30

DETAILS OF COURSE CONTENTS:

S. NO.	TOPIC	Total Hrs.	WEIGHTAGE
1	Introduction 1.1 Definition of solid waste, different types of solid waste 1.2 Sources of solid waste, Classification of solid waste – hazardous and non- hazardous waste. 1.3 Physical and chemical characteristics of municipal solid waste.	08	20 %
2	Storage, Collection and Transportation of Municipal	08	18 %

	Solid Waste 2.1 Collection, segregation, storage and transportation of solid waste. 2.2 Tools and Equipment 2.3 Transportation vehicles with their working capacity 2.4 Transfer station- meaning, necessity, location. 2.5 Role of rag pickers and their utility for society.		
3	Composting of Solid Waste 3.1 Concept of composting of waste, Principles of composting process. 3.2 Factors affecting the composting process. 3.3 Methods of composting	07	19 %
4	Techniques for Disposal of Solid Waste 4.1 Solid waste management techniques 4.2 Land filling technique 4.3 Factors to be considered for site selection 4.4 Land filling methods 4.5 Advantages and disadvantages of landfill method 4.6 Recycling of municipal solid waste 4.7 Incineration of waste: Introduction of incineration process 4.8 Types of incinerators 4.9 Pyrolysis of waste – Definition, Methods	10	24 %
5	Biomedical, Industrial and E-waste management 5.1 Definition of Bio medical Waste. 5.2 Sources and generation of Biomedical Waste and its classification 5.3 Bio medical waste Management technologies. 5.4 Definition, varieties and ill effects of E- waste, 5.5 Recycling and disposal of E- waste. 5.6 Definition of Industrial Waste and sources. 5.7 Recycling and utilization of Industrial waste.	09	19 %

COURSE OUTCOME:

After competing this course, student will be able to:

1. Identify the sources of solid waste.
2. Select the relevant method of collection and transportation of solid waste.
3. Suggest an action plan for composting of solid waste.
4. Devise suitable disposal technique for solid waste.
5. Use the relevant method for disposal of Bio-medical and E-waste.

LIST OF PRACTICAL:

The exercises/practical/experiments should be properly designed and implemented with an attempt to develop different types of practical skills so that students are able to acquire the competencies (Program outcomes). Following is the list of exercises/practical/experiments for guidance.

SR. No.	EXERCISES
1	To find innovative practices or techniques for solid waste management.
2	A field visit of dump sites of solid waste and find way of how to reduce?
3	Finding innovative ways for recycle or reuse of solid waste.

LIST OF REFERENCES:

1. Gupta O.P, Elements of Solid Hazardous Waste Management, Khanna Book Publishing Co., Delhi Ed. 2018
2. Bhide, A. D., Solid Waste Management, Indian National Scientific Documentation Centre, New Delhi.
3. George Techobanoglous, Kreith, Frank., Solid Waste, McGraw Hill Publication, New Delhi.
4. Sasikumar, K., Solid Waste Management, PHI learning, Delhi.
5. Hosetti, B.B., Prospect and Perspectives of Solid Waste Management, New Age International Publisher

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Identify the sources of solid waste.	1 Remembering
CLO2	Select the relevant method of collection and transportation of solid waste	2 Understanding, 3 Applying
CLO3	Suggest an action plan for composting of solid waste.	2 Understanding
CLO4	Devise suitable disposal technique for solid waste.	3 Applying, 2 Understanding
CLO5	Use the relevant method for disposal of Bio-medical and E-waste.	3 Applying 4 Analyze

Course Learning Outcomes	Program Outcomes(Pos)											
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CLO1	L											
CLO2	M	M										
CLO3	H		M				H					
CLO4	H	H			I	L				I	L	
CLO5	L		L				H					

H:High, M:Medium, L:Low