**17CE41E5 – SOLID WASTE MANAGEMENT**

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| **Course Category** | Core Elective | **Credits** | 3 |
| **Course Type** | Theory | **Lecture - Tutorial - Practical** | 3 - 0 - 0 |
| **Prerequisite** | None | **Sessional Evaluation** | 40 |
| **Semester End Exam Evaluation** | 60 |
| **Total Marks** | 100 |

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| **Course Objectives** | 1. To understand the need of solid waste management. 2. To understand the characteristics of municipal solid waste from different sources. 3. To understand the on land processing and storage mainly from commercial sources. 4. To understand the collection, transport techniques of solid waste from different sources. 5. To analyse the segregation of different materials in solid waste such as reusable, recyclable and disposable. 6. To study about the characteristics, treatment methods and disposable options for hazardous wastes. | |
| **Course Outcomes** | CO1 | Know the impacts of solid waste generation. |
| CO2 | Learn about different sources of solid waste. |
| CO3 | Learn how to store, collect and transfer the solid waste from generation place to disposal site. |
| CO4 | Learn the processing and product recovery from solid waste. |
| CO5 | Learn study various disposal techniques and management options for solid waste. |
| CO6 | Study about special wastes and to learn how to deal with them. |
| **Course**  **Content** | **UNIT – I**  **INTRODUCTION:** Goals and objectives of solid waste management – Impacts of solid waste generation in a technological society – Principle of solid waste management – Social and economic aspects – Public awareness – Quantities of solid wastes – Challenges and opportunities – Data on Indian city wastes.  **UNIT –II**  **SOURCES AND TYPES OF MUNICIPAL SOLID WASTES:** Sources and types of solid wastes – Factors affecting generation of solid wastes – Characteristics – Methods of sampling and characterization – Effects of improper disposal of solid wastes – Public health effects.  **UNIT – III**  **ONSITE HANDLING – STORAGE AND PROCESSING:** Onsite handling –Methods used at residential and commercial sources –Onsite storage dust bins –Community containers container locations onsite processing methods –Public health & economic aspects of storage.  **COLLECTION AND TRANSFER:** Methods of Collection – Types of vehicles – Manpower requirement – Collection routes –Transfer stations – Selection of location –Operation & maintenance –Options under Indian conditions.  **UNIT – IV**  **PROCESSING TECHNIQUES AND EQUIPMENT:** Purpose of processing paling shredding and incineration and types of incinerators.  **RECOVERY OF PRODUCTS AND ENERGY:** Material processing and recovery systems –Recovery of chemical conversion products –Recovery of biological conversion products recovery of energy from conversion products.  **UNIT – V**  **DISPOSAL OF SOLID WASTES:** Sanitary landfills – General considerations –Site selection – Operational management systems in land fill – Gas and leachate control – construction –Ocean disposal of solid wastes – Application of GIS in Land Fill.  **UNIT – VI**  **HAZARDOUS WASTES:** Special wastes - Hazardous wastes –Hospital wastes –Sewage sludges –Industrial solid wastes –Methods of disposal. | |

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| **Textbooks**  **and**  **References** | **TEXTBOOKS:**   1. Industrial Solid Waste Management & Land Filling Practice by Datta.M Parida B S Guha B.K.and Sreekrishna. T. R. 2. Solid Waste Management in developing by Bhide, A.D. and Sundaresam B.B. 3. George Tchobanoglouset.al.,Integrated Solid Waste Management, McGraw-Hill Publishers, 1993. 4. B.Bilitewski,G.HardHe, K.Marek, A.Weissbach and H.Boeddicker, Waste Management, Springer,1994.   **REFERENCE BOOKS:**   1. Liquid waste of Industry by New Merow. 2. Water and Waste Water Technology by Mark J. Hammer and Mark J. Hammer (Jr.). 3. Waste Water Treatment & Use in Agriculture by Pescond.M,B.R.E.Landreth and P.A.Rebers. |