

## Environmental Management

<b>Course Code</b>	<b>19CE5606E</b>	<b>Year</b>	III	<b>Semester</b>	II
<b>Course Category</b>	Open Elective-II	<b>Branch</b>	Common to all	<b>Course Type</b>	Theory
<b>Credits</b>	3	<b>L-T-P</b>	3-0-0	<b>Prerequisites</b>	19BS1103- Chemistry of Materials
<b>Continuous Internal Evaluation:</b>	30	<b>Semester End Evaluation:</b>	70	<b>Total Marks:</b>	100

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<b>Course Outcomes</b>	
Upon successful completion of the course, the student will be able to	
<b>CO1</b>	<b>Analyze</b> the sources and composition of Municipal Solid Waste
<b>CO2</b>	<b>Distinguish</b> between different solid waste management methods and relate its effect on soil
<b>CO3</b>	<b>Determine</b> different types of Hazardous wastes and their safe disposal methods
<b>CO4</b>	<b>Illustrate</b> importance of EIA and its assessment methodologies
<b>CO5</b>	<b>Assess</b> impacts of air and water and their significance

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<b>Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)</b>														
Note: 1- Weak correlation    2-Medium correlation    3-Strong correlation														
* - Average value indicates course correlation strength with mapped PO														
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO1</b>	3	2	1		1		2	2					1	2
<b>CO2</b>	3		2		2		2	2					1	2
<b>CO3</b>	3		2		1		2	2					1	2
<b>CO4</b>	3		1		1		2		1				1	2
<b>CO5</b>	3		1		1		2		1				1	2

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<b>Course Content</b>		
UNIT-1	Introduction: Sources and types of municipal solid wastes-waste generation rates-factors affecting generation, characteristics-methods of sampling and characterization, segregation of solid wastes – source reduction of waste – objectives of waste processing, elements of solid waste management – municipal and bio medical solid waste rules – public role in solid waste management.	CO1.
UNIT-2	Resource recovery from solid waste composting and biomethanation; materials-soil pollution: sources, types of soil pollution, effects of fertilizers, pesticides and radioactive material on soils, land disposal of solid waste; sanitary landfills – site selection; landfill liners – management of leachate.	CO2.
UNIT-3	Hazardous Waste Management: Sources and types of hazardous waste characteristics of hazardous wastes; collection-handling-processing techniques-disposal methods; hospital waste management - processing techniques - disposal.	CO3
UNIT-4	Conceptual Facts of EIA: Introduction, definition and scope of EIA objectives	CO4

	in EIA, basic EIA principles, classification of EIA, strategic EIA (SEIA), regional EIA, sectoral EIA, project level EIA and life cycle assessment, project cycle, Environmental baseline monitoring (EBM), preliminary study to determine impact significance, Impact Assessment Methodologies.	
UNIT-5	Prediction of Impacts (Air and Water): Air and water environment, sources and basic information on water and air conceptual approach for addressing air and water environment impacts, assessment of impacts air, water, noise, soil, biological and socioeconomic impacts, assessment of impact significance.	CO5
<b>Learning Resources</b>		
<b>Text Books</b>	1. Integrated Solid waste management by Goerge Tchobanolous, Hilary Theisen & Samuel A. Vigil. McGraw Hill International Editions 2. Y. Anjaneyulu, Environmental Impact Assessment, B.S. Publications, 2003.	
<b>Reference Books</b>	1. CPCB Manual on solid waste Management 2. Technological guidance manuals of EIA, MoEF 3. M. Anjireddy, Textbook of Environmental Science and Technology, BS Publications, 2010.	
<b>e-Resources &amp; other digital material</b>	1. <a href="http://www.nptel.ac.in/courses/120108005">www.nptel.ac.in/courses/120108005</a> 2. <a href="http://nptel.ac.in/courses/10510605">nptel.ac.in/courses/10510605</a> 3. <a href="https://www.coursera.org/learn/solid-waste-management">https://www.coursera.org/learn/solid-waste-management</a>	