

**INDUSTRIAL WATSE MANAGEMENT**

<b>Offering Branches</b>	CE		
<b>Course Category:</b>	HONORS	<b>Credits:</b>	4
<b>Course Type:</b>	Theory	<b>Lecture-Tutorial-Practical:</b>	3-1-0
<b>Prerequisites:</b>	20MC1301 – Environmental Science	<b>Continuous Evaluation:</b>	30
		<b>Semester End Evaluation:</b>	70
		<b>Total Marks:</b>	100

**Course Outcomes**

Upon successful completion of the course, the student will be able to:

<b>CO1</b>	<b>Illustrate</b> the sources properties & effects industrial effluents	K2
<b>CO2</b>	<b>Classify</b> relevant pre and primary treatment options for industrial effluents and waste reduction	K4
<b>CO3</b>	<b>Identify</b> the different disposal methods for solids	K3
<b>CO4</b>	<b>Select</b> appropriate pollution control strategies for wastes from Manufacturing Industries	K3
<b>CO5</b>	<b>Utilize</b> proper pollution control strategies for wastes from Food processing Industries	K3

**Contribution of Course Outcomes towards achievement of Program Outcomes**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
<b>CO1</b>	2	2	2			2	2						2	2
<b>CO2</b>	2	2	2			3	3						2	3
<b>CO3</b>	3	3	3			2	2						3	2
<b>CO4</b>	2	2	2			2	2						2	2
<b>CO5</b>	2	2	2			2	2						2	2
<b>Avg.</b>	<b>2</b>	<b>2</b>	<b>2</b>			<b>2</b>	<b>2</b>						<b>2</b>	<b>2</b>

**1- Low**

**2-Medium**

**3-High**

**Course Content**

<b>I</b>	<b>Introduction of Industrial Waste Treatment:</b> Principles of industrial waste management, sources of pollution, physical, chemical, organic and biological properties, effects of waste water on streams, land environment and human health.	<b>CO1</b>
<b>II</b>	<b>Waste Reduction:</b> Waste reduction, alternatives for raw materials, process changes, housekeeping – pre-treatment of wastes, <b>Pre and primary treatment:</b> Collection of wastes, segregation – equalization – reduction in volume and strength by other methods – theories of neutralization – equalizations and proportioning.	<b>CO2</b>
<b>III</b>	<b>Different disposal methods of different solids:</b> A review of the methods adopted for the removal of suspended, colloidal and dissolved organic solids, removal of inorganic solids – disposal of sludge – selection of site for the plant.	<b>CO3</b>
<b>IV</b>	<b>Material Manufacturing Industries:</b> Manufacturing processes, flow sheets, characteristics and composition of wastes including waste reduction, treatment and disposal methods of Material Industries: Paper, and Textile	<b>CO4</b>
<b>V</b>	<b>Food Processing Industries:</b> Manufacturing processes, flow sheets, characteristics and composition of wastes including waste reduction, treatment and disposal methods of Sugar Mills and Dairy Industries	<b>CO5</b>

**Learning Resources**

<b>Text Books</b>	Nelson Leonard Nemerow, Industrial Waste Treatment, Butterworth-Heinemann, 2007
<b>Reference Books</b>	M.N. Rao and A.K. Datta, Industrial Waste Management, xford & IBH Publishing Co Pvt.Ltd, rd edition edition,2018
<b>e- Resources &amp; other digital material</b>	<a href="https://nptel.ac.in/courses/105106119/36">https://nptel.ac.in/courses/105106119/36</a>