

19CE4802E – INDUSTRIAL WASTE MANAGEMENT

Course Category:	Program Elective	Credits:	3
Course Type:	Theory	Lecture-Tutorial- Practical:	3-0-0
Prerequisites:	19CE3404 - Environmental Engineering 19BS1103- Chemistry of Materials	Continuous Evaluation:	30
		Semester End Evaluation:	70
		Total Marks:	100

Course Outcomes

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

CO1	Characterize industrial effluents	K2
CO2	Identify relevant pre and primary treatment options for industrial effluents and waste reduction	K2
CO3	Review and understand the disposal methods of different solids	K2
CO4	Suggest pollution control strategies for Manufacturing Industries	K3
CO5	Suggest pollution control strategies for 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
CO1	3												1	2
CO2	3	2											1	2
CO3	3						2						1	2
CO4	3		2				2						1	2
CO5	3		2				2						1	2
Avg.	3	2	2				2						1	2

1- Low

2-Medium

3-High

Course Content

UNIT-1	Introduction of Industrial Waste Treatment: 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.	CO1.
UNIT-2	Waste Reduction: Waste reduction, alternatives for raw materials, process changes, housekeeping – pre-treatment of wastes, Pre and primary treatment: Collection of wastes, segregation – equalization – reduction in volume and strength by other methods – theories of neutralization – equalizations and proportioning.	CO2.
UNIT-3	Different disposal methods of different solids: 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.	CO3
UNIT-4	Material Manufacturing Industries: Manufacturing processes, flow sheets, characteristics and composition of wastes including waste reduction, treatment and disposal methods of Material Industries: Paper, Steel plant, Textiles and Fertilizers.	CO4
UNIT-5	Food Processing Industries: Manufacturing processes, flow sheets, characteristics and composition of wastes including waste reduction, treatment and disposal methods of Tanneries, Sugar Mills, Distillers, Dairy and Food Processing industries	CO5

Learning Resources

Text Books	1. Nelson Leonard Nemerow, Industrial Waste Treatment, Butterworth-Heinemann, 2007
Reference Books	1. M.N. Rao and A.K. Datta, Industrial Waste Management, xford & IBH Publishing Co Pvt.Ltd, rd edition edition,2018
e-Resources& other digital material	1. https://nptel.ac.in/courses/105106119/36