

		National Institute of Technology Meghalaya An Institute of National Importance							CURRICULUM		
Programme		Master of Technology					Year of Regulation			2018-19	
Department		Civil Engineering					Semester			II	
Course Code	Course Name	Pre-requisite	Credit Structure				Marks Distribution				
			L	T	P	C	INT	MID	END	Total	
CE 538	Industrial Wastewater Pollution Control	NIL	3	0	0	3	50	50	100	200	
Course Objectives	1. Distinguish between the quality of domestic and industrial water requirements and Wastewater quantity generation 2. Understand the industrial process, water utilization and wastewater generation. 3. Impart knowledge on selection of treatment methods for industrial wastewater 4. Acquire the knowledge on operational problems of common effluent treatment plants. 5. Gain knowledge on different techniques and approaches for minimizing the generation and application of Physio chemical and biological treatment methods for recovery, reuse and disposal of industrial wastewater.		Course Outcomes	CO1	Able to recognize the properties of the basic industries and the environmental impact of water and wastewater generated.						
				CO2	Able to determine the appropriate treatment methods for textile industry wastewater						
				CO3	Able to make the selection process for high organic load of wastewater treatment needed.						
				CO4	Able to compare the methods used in wastewater treatment and waste containing heavy metals such as metal plating and refinery.						
				CO5	Be able to design different treatment methods, pharmaceutical industry and the chemical industries which produces of wastewater properties of, operational problems.						
SYLLABUS											
No.	Content							Hours		COs	
I	Introduction: Industrial Wastewater Characteristics, Toxic chemicals from industry, Preliminary and Primary Treatment, Unit Operations and Unit processes, Biological Treatment Processes							8		CO1, CO 2	
II	Advanced wastewater treatment: Advanced wastewater treatment, Attached & Suspended Growth systems, Sludge Treatment and Disposal,							8		CO2, CO3, CO4	
III	Industrial wastewater versus municipal wastewater Industrial wastewater versus municipal wastewater; Effects of industrial wastewater on receiving water bodies and municipal wastewater treatment plant; Bioassay test; Sampling techniques; Stream protection measures; Volume reduction, strength reduction, Neutralization, Equalization, Proportioning;							10		CO2, CO3, CO4	
IV	Combined treatment of industrial wastewater with domestic sewage: Combined treatment of raw industrial wastewater with domestic sewage; Zero discharge concepts; Removal of specific pollutants in industrial effluents, e.g. oil & grease, phenol, cyanide, toxic organics, heavy metals; Characteristics and treatment of various industrial effluents.							10		CO4, CO5,	
Total Hours							36				
Essential Readings											
1. M. A. Hashim and J. A. Darwish, Industrial Wastewater Treatment: Contemporary Technologies and Future Directions, 1st ed., CRC Press, 2023.											
2. A. H. Mahvi and M. Vaezi, Advanced Industrial Wastewater Treatment and Reuse, 1st ed., Springer, 2022.											
3. A. K. Chaturvedi and B. N. B. Murthy, Industrial Wastewater Management, Treatment and Disposal, 4th ed., McGraw-Hill Education, 2021.											
Supplementary Readings											
1. A. I. Zouboulis and K. A. Matis, Innovative Technologies in Wastewater Treatment, 1st ed., Wiley-VCH, 2020.											
2. D. W. Smith, Pollution Control for Chemical and Allied Industries: Industrial Wastewater, 1st ed., Elsevier, 2024.											