	National Institute of Technology Meghalaya An Institute of National Importance	CURRICULUM

Programme	**Master of Technology**	Year of Regulation	**2025**
Department	**Civil Engineering**	Semester	**I**

Course Code	Course Name	Pre requisite	Credit Structure				Marks Distribution			
			L	T	P	C	INT	MID	END	Total
CE 575	**Water & Wastewater Quality Analysis Lab**	**NIL**	**0**	**1**	**2**	**2**			**100**	**100**

Course Objectives	1. To familiarize students with the standard methods for analyzing physical, chemical, and biological parameters of water and wastewater.	Course Outcomes	CO1 Able to understand and apply standard protocols for water and wastewater quality analysis.
	2. To develop skills in sampling, sample preservation, and lab safety practices.		CO2 Able to analyze key water quality parameters
	3. To enhance the interpretation of analytical data for environmental monitoring and treatment design.		CO3 Able to Interpret results in the context of environmental standards (e.g., BIS, CPCB).
			CO4 Able to conduct accurate and safe laboratory experiments with proper documentation.
			CO5 Able to evaluate water treatment needs based on test outcomes.

No.	COs	Mapping with Program Outcomes (POs)											Mapping with PSOs			
		PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	CO1	**0**	**3**	**3**	**2**	**3**	**2**	**0**	**0**	**3**	**0**	**3**	**3**	**0**	**3**	**2**
2	CO2	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**3**	**0**	**3**	**3**	**0**	**3**	**2**
3	CO3	**0**	**3**	**3**	**2**	**3**	**0**	**0**	**0**	**3**	**0**	**3**	**3**	**0**	**3**	**2**
4	CO4	**0**	**3**	**3**	**2**	**3**	**0**	**0**	**0**	**3**	**0**	**3**	**3**	**0**	**3**	**2**
5	CO5	**0**	**3**	**3**	**2**	**3**	**2**	**0**	**0**	**3**	**0**	**3**	**3**	**0**	**3**	**2**

SYLLABUS

No.	Content	Hours	COs
I	To find the turbidity and colour of a given sample of water.	**1**	**CO1, CO3, CO5**
II	To determine the pH value of a given sample of water.	**1**	**CO1**
III	To determine the conductivity of a given sample of water	**1**	**CO1**
IV	To find out total dissolved solid, settleable solids and suspended solids of the given sample	**2**	**CO1, CO3, CO5**
V	To determine the carbonate, bicarbonate, and hydroxide alkalinity of a sample.	**2**	**CO1, CO3, CO5**
VI	To find out the concentration of chlorides in the given sample of water.	**1**	**CO1, CO3, CO5**
VII	To estimate the hardness of the given sample of water by standard EDTA method.	**2**	**CO1, CO3, CO5**
VIII	To find the optimum amount of coagulant required to treat the turbid water by Jar Test.	**2**	**CO1, CO3, CO5**
IX	To determine residual chlorine in a given sample of water.	**2**	**CO6**
X	To find the quantity of dissolved oxygen (DO) present in the given sample.	**2**	**CO4**
XI	To determine biochemical oxygen demand (BOD) exerted by the given waste water sample	**2**	**CO4**
XII	To determine Chemical oxygen demand (COD) exerted by the given waste water sample	**2**	**CO4**
XIII	To determine MPN of coliforms of the given sample.	**2**	**CO4**
XIV	To determine Nitrate, phosphate, and sulfate analysis	**2**	**CO4**
XV	To determine Heavy metal analysis using spectrophotometry (e.g., Fe, Pb, Cr)		
Total Hours		**24**	

Essential Readings

1. APHA, Standard Methods Examination of Water and Wastewater, American Public Health Association, Washington DC, 22nd Edition.
2. Metcalf & Eddy (Revised by G. Tchobanoglous, F. L. Burton and H. D. Stensel), “Wastewater Engineering Treatment and Reuse”, Tata McGraw Hill.4 th Edition

Supplementary Readings

1. Peavy H. S., Rowe D. R. and George Tchobanoglous, “Environmental Engineering”, McGraw-Hill International.First Edition
2. McGhee T. J ., “Water Supply and Sewerage”, McGraw-Hill Inc., 6th edition
3. Davis M. L and Cornwell D. A “Introduction to Environmental Engineering”, McGraw-Hill, Inc.5 th Edition.
4. Sawyer C. N., McCarty P. L and Parkin G. F., “Chemistry for Environmental Engineers”, McGraw- Hill. Fifth edition.
5. Manual for Sewer and Sewerage, Central Public Health & Environmental Engineering Organization, Ministry of Housing and Urban Development, Govt. of India.
6. Manual for water supply and treatment, Central Public Health & Environmental Engineering Organization, Ministry of Housing and Urban Development, Govt. of India.