



# MEHRAN UNIVERSITY OF ENGINEERING AND TECHNOLOGY JAMSHORO

## Department of Civil Engineering




### LESSON PLAN

COURSE TITLE: Environmental Engineering II		COURSE CODE: CE431	CREDIT HOURS: 03	MINIMUM CONTACT HOURS: 48	
COURSE INSTRUCTOR: Prof. Dr. Ashfaqe Ahmed Pathan(B+D)/Engr. Hafiz Usama Imad (A+C)					
Batch: 20CE	Semester: 7 <sup>th</sup>	Semester Starting Date: 20-11-2023	Semester Suspension Date: 29-03-2024		
COURSE LEARNING OUTCOMES: Upon successful completion of the course, the student will be able to:					
CLO No.	Description	Taxonomy Level	Linking to PLOs		
1	DESCRIBE various characteristics of municipal and industrial wastewater and its composition, solid waste management, air and noise pollution.	C2	1		
2	EXPLAIN wastewater collection and conveyance systems, understanding the management tools for solid waste reduction, reuse and recycling.	C2	2		
3	DESIGN the wastewater treatment plant and manage the hazardous waste for societal and environmental sustainability.	C6	7		
LESSON CONTENTS AND ASSOCIATED CLO(s)					
Contents		CLO No.	Marks Assigned	Delivery Methods	Assessment Methods (Marks)
<ul style="list-style-type: none"><li><b>Wastewater Engineering and Wastewater Quality:</b> Introduction of wastewater engineering, Wastewater terminology, Characteristics of municipal industrial wastewater, Wastewater composition. Sampling techniques. Wastewater quality and analysis. quality parameters/monitoring</li><li><b>Waste water Infrastructure (collection and conveyance):</b> Sewerage systems, methods of carrying wastewater and its disposal, sewer materials, shapes, fittings and joints, Surface drains, sewer appurtenances, house drainage system</li><li><b>Air and Noise Pollution:</b> Air pollution: their origin, sources, types, effects, and dispersion, Control of air pollutants, air emission measurement and control, ambient air quality. Noise pollution: concept of sound and sound pressure level, noise sources and their effects on health. Acoustic environmental criteria (safety and health at work), Noise measurement and control.</li><li><b>SOLID AND HAZARDOUS WASTE MANAGEMENT</b> Characteristics of solid waste. Generation-collection-transferring-and disposal of waste (incineration and landfill options). Waste minimization: recycling reuse of solid waste, composting. Hazardous waste: classification and treatment, contaminated sites</li></ul>		1	49	<ul style="list-style-type: none"><li>Online Lectures</li><li>Discussions</li></ul>	<ul style="list-style-type: none"><li>Assignment -I (5)</li><li>Mid semester Exam (20)</li><li>Final Exam (24)</li></ul>

and their remedies. <b>No. of Lectures : 24</b>				
<ul style="list-style-type: none"> <li><b>Wastewater Treatment Unit Processes / Operations:</b> Estimating wastewater quantity Conventional wastewater treatment systems, Municipal wastewater treatment unit processes: physical treatment methods, Biological treatment methods, special/physico-chemical and chemical treatment methods. Sludge disposal and reuse. Wastewater reclamation and reuse, Natural treatment self-purification systems.</li> </ul> <b>No. of Lectures: 10</b>	2	22	<ul style="list-style-type: none"> <li>Online Lectures</li> <li>Discussions</li> </ul>	<ul style="list-style-type: none"> <li>Assignment - II (5)</li> <li>Test-I (05)</li> <li>Final Exam (12)</li> </ul>
<ul style="list-style-type: none"> <li><b>Design of a Wastewater Treatment Plant:</b> Design of bar racks and screens, grit chambers, sedimentation tanks (detritus tanks, skimming tanks), Activated sludge processes, aerated lagoons, Trickling filters, Rotating biological contractors, Stabilization ponds, nutrients, odor and VOCs control, Sludge thickeners and digesters, Composting units, Dewatering equipment, Wetlands.</li> <li>Design of sewers, laying and testing of sewers, ventilation of sewers, cleaning of sewers</li> </ul> <b>No. of Lectures: 14</b>	3	29	<ul style="list-style-type: none"> <li>Online Lectures</li> <li>Discussions</li> <li>Design Practice</li> </ul>	<ul style="list-style-type: none"> <li>Final Exam (24)</li> <li>Test II (5)</li> </ul>

#### ASSESSMENT DETAILS

S. No.	Assessment Activities	Marks	Activities		CLO(s) to be assessed
1	Class Test/Assignment/Project Design/ Presentation/Quiz/Field Report	20	Assignment(s)	2	1 and 2
			Class test(s)	2	2 and 3
2	Mid Semester Exam	20	1		1
3	Final Semester Exam	60	1		1, 2 and 3

Prepared by: <b>Dr. Ashfaque Ahmed Pathan</b>  Signature: Dated: 1511.2023	Reviewed by: <b>Curriculum Review Committee</b>  Signature: Dated: 12-12-2023	Approved by: <b>Chairman, CED</b>  Signature: Dated: 12-12-2023
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