

Techno India NJR Institute of Technology



Environmental Engineering Design and Lab (6CE4-21)

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For Techno India NJR Institute of Technology
पंकज पौरवाल
Dr. Pankaj Kumar Perwal
(Principal)



RAJASTHAN TECHNICAL UNIVERSITY, KOTA
Syllabus

3rd Year - VI Semester: B.Tech. (Civil Engineering)

6CE4-21: Environmental Engineering Design and Lab

Credit: 1.5

OL+OT+3P

Max. Marks: 75(IA:45, ETE:30)

End Term Exam: 3 Hours

Design

1. Population forecasting and water demand
2. Water Quality parameters
3. Design of Sedimentation tanks, coagulation and flocculation tanks
4. Design of rapid and slow sand filters
5. Design of disinfection units and transmission systems
6. Design of Sewer lines and storm water systems
7. Design of aerobic and anaerobic treatment units
8. Design of suspended and attached growth systems

Lab.

1. Physical Characterization of water: Turbidity, Electrical Conductivity, pH
2. Analysis of solids content of water: Dissolved, Settleable, suspended, total, volatile, inorganic etc.
3. Alkalinity and acidity, Hardness: total hardness, calcium and magnesium hardness
4. Optimum coagulant dose
5. Chemical Oxygen Demand (COD)
6. Dissolved Oxygen (D.O) and Biochemical Oxygen Demand (BOD)
7. Break point Chlorination
8. Bacteriological quality measurement: MPN,

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Course Overview:

Environmental Engineering combines the principles of engineering, chemistry, and biology to provide safe water, sanitation, and clean air. With an increasing demand for safer environments, the need for highly trained environmental engineers is growing. Environmental engineers design systems that protect people and planet from the mismanagement of toxic and hazardous waste. And they develop solutions to rehabilitate impacted terrestrial and aquatic environments. From wastewater treatment systems to air quality management technologies, environmental engineers are creating a cleaner and safer tomorrow

Course Outcomes:

CO.NO.	Cognitive Level	Course Outcome
1	Analysis	Understand about the water quality parameters and their permissible limits as per the standards.
2	Evaluation	Analyze the physical tests to be conducted for the water before supply.
3	Synthesis	Analyze chemical tests to be conducted for the water before supply.
4	Synthesis	Accumulate the information about water supply fittings.
5	Application	Calculate physical chemical properties by lab experiments for sewage sample.

Prerequisites:

1. Analyze characteristics of water and wastewater
2. Students will develop an appreciation for the importance of environmental engineering as a major factor in preserving and protecting human health and the environment

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Course Outcome Mapping with Program Outcome:

Course Outcome	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO363.1	3	2	2	2	2	2	2	1	2	1	1	1	2	2	1
CO363.2	3	2	2	2	2	2	1	1	2	1	2	2	2	1	1
CO363.3	3	2	2	2	2	2	1	1	2	1	2	2	2	1	1
CO363.4	2	2	3	3	2	1	3	1	1	1	1	2	2	2	1
CO363.5	2	2	2	3	1	1	2	1	1	2	1	2	2	2	1
CO363 (AVG)	2.6	2	2.2	2.4	1.8	1.6	1.8	1	1.6	1.2	1.4	1.8	2	1.6	1

Course Coverage Module Wise:

Lab No.	Experiments List According to RTU Syllabus
1	Physical Characterization of water: Turbidity, Electrical Conductivity, pH
2	Analysis of solids content of water: Dissolved, Settleable, suspended, total, volatile, inorganic etc
3	Alkalinity and acidity, Hardness: total hardness, calcium and magnesium hardness
4	Optimum coagulant dose
5	Chemical Oxygen Demand (COD)
6	Dissolved Oxygen (D.O) and Biochemical Oxygen Demand (BOD)
7	Break point Chlorination
8	Bacteriological quality measurement: MPN
12	Development of Plan, Front Elevation and Sectional Elevation from line diagram
	Advance List of Experiment Beyond The RTU Syllabus
1	Field Sample Collection of Water and Sewage

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Faculty Lab Manual Link

1. https://r.search.yahoo.com/_ylt=AwrxzALl4qhxC3UAPWu7HAx.;_ylu=Y29sbwNzZzMEcG9zAzEEdnRpZAMEc2VjA3Ny/RV=2/RE=1638749029/RO=10/RU=https%3a%2f%2fwww.iare.ac.in%2fsites%2fdefault%2ffiles%2flab1%2fEnvironmental_Engineering%2520_Laboratory_Lab_MANUAL.pdf/RK=2/RS=wegI0PvdQ_xKJ3fWJJE2IP5K808-

Assessment Methodology:

1. Practical exam Of Environmental lab Experiment
2. Internal exams and Viva Conduct.
3. Final Exam (practical paper) at the end of the semester.

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