ENVIRONMENTAL ENGINEERING LAB
(Syllabus)

Course Code	23CE3651	Year	III	Semester	II
Course Category	Professional Core	Branch	CIVIL	Course Type	Practical
Credits	1.5	L-T-P	0-0-3	Prerequisites	Environmental Science
Continuous Internal Evaluation	30	Semester End Evaluation	70	Total Marks:	100

Course Learning Objectives:

The course will address the following:

- Estimation of some important characteristics of water and wastewater in the laboratory.
- It also gives the significance of the characteristics of the water and wastewater.

Course Outcomes:

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

CO	Statement	Blooms level
CO 1	Estimate some important characteristics of water and wastewater in the laboratory.	**L3**
CO 2	Draw conclusions and decide whether the water is suitable for construction, drinking or ultimate disposal as per effluent standards.	**L4**
CO 3	Decide whether the water body is polluted or not with reference to the stated parameters in the list of experiments.	**L4**
CO 4	Estimate and study the strength of the raw and treated effluents in terms of BOD, COD, pH, TDS and chloride of the neutralization tank treating effluents from the Environmental Engineering Laboratory.	**L3**

Course Articulation Matrix:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO 1	3	2	1	3	2	1		1	1		1	3	2
CO 2	2	3	2	2	1	2			1		1	2	2
CO 3	2	3	1	2	1	3			1		1	2	3
CO 4	3	2	1	3	1	2			1		1	3	2

(1 = Low, 2 = Medium, 3 = High)

List of Experiments

Sl. No.	Name of the Experiment	Mapped COs
1	Determination of pH and Electrical Conductivity (Salinity) of water and soil.	CO1, CO2, CO3
2	Determination and estimation of Total Hardness - Calcium and Magnesium.	CO1, CO2, CO3
3	Determination of Alkalinity/Acidity.	CO1, CO2, CO3
4	Determination of Chlorides in water and soil.	CO1, CO2, CO3, CO4
5	Determination and estimation of Total Solids, Organic Solids, Inorganic Solids and Settleable Solids using an Imhoff Cone.	CO1, CO2, CO3, CO4
6	Determination of Iron.	CO1, CO2, CO3
7	Determination of Dissolved Oxygen using D.O. Meter and Winkler Method, and determination of B.O.D.	CO1, CO2, CO3, CO4
8	Determination of N, P and K values in solid waste.	CO1, CO3
9	Measurement of physical parameters - Temperature, Colour, Odour, Turbidity and Taste.	CO1, CO2, CO3
10	Determination of C.O.D.	CO1, CO2, CO3, CO4
11	Determination of optimum coagulant dose.	CO1, CO2, CO3
12	Determination of chlorine demand.	CO1, CO2, CO3
13	Presumptive coliform test.	CO1, CO2, CO3
14	Visit a Water Treatment Plant and prepare a technical report.	CO2, CO3, CO4

NOTE: At least 10 of the above experiments are to be conducted.

Learning Resource(s)

Text Book(s)

1. Standard Methods for the Examination of Water and Wastewater, APHA.
2. K.V.S.G. Murali Krishna, Chemical Analysis of Water and Soil, ReemmPublications, New Delhi.

Reference Book(s)

1. Relevant IS Codes for Water and Wastewater Analysis and Treatment.
2. C.N. Sawyer, P.L. McCarty and G.F. Parkin, Chemistry for Environmental Engineering and Science, McGraw-Hill.

Web Materials

1. https://nptel.ac.in/courses/105104102/
2. https://nptel.ac.in/courses/105105048/

Faculty **HoD-CE**