ENVIRONMENTAL ENGINEERING LABORATORY

VII Semester: CE								
Course Code	**Category**	**Hours / Week**			**Credits**	**Maximum Marks**		
ACE112	**Core**	**L**	**T**	**P**	**C**	**CIA**	**SEE**	**Total**
		-	-	3	2	30	70	100
Contact Classes: 0	**Tutorial Classes: 0**	**Practical Classes: 36**				**Total Classes: 36**		

COURSE OBJECTIVES:

The course should enable the students to:
  I. Investigate the different characteristics of water & wastewater Understand the shift from 2D representation to 3D simulation.
 II. Outline the procedure for preparations of stock and standard solutions, their handling, storage, etc. Explore new project delivery systems and technologies for integrated practice.
III. Assess the suitability of water for drinking, irrigation purpose and concreting works.
IV. Determine the BOD, COD and bacterial density of portable water.

COURSE LEARNING OUTCOMES (CLOs):

1. Extrapolate the knowledge of preparation of PH in water.
2. Use innovative methods to improve the quality of soft water for industrial purpose at cheaper cost.
3. Evaluate conductometry and conductometric titrations .Estimate potentiometric and potentiometric titrations
4. Compare the results of experiments with potentiometer.
5. Describe PH in water and their properties with different samples.
6. Identify the formula for dissolved oxygen.
7. Explain certain properties of water using the concepts of alkalinity and acidity
8. Develop theoretical aquatic chemistry basis and use the principles for the evaluation of water quality.
9. Describe the rate constant for a reaction and elementary steps in the reaction mechanism.
10. Explore the basic knowledge of adsorption.
11. Understand principles and their practical application chromatographic separation

Week-1	INTRODUCTION TO ENVIRONMENTAL ENGINEERING LABORATORY. DETERMINATION OF PH AND TURBIDITY

Introduction to environmental engineering. Do's and Don'ts in the lab.
Batch I: To determine the pH of given samples using universal indicator, pH paper and digital pH meter
Batch II: Determination of turbidity of the given sample using nephelometer in NTU.

Week-2	DETERMINATION OF PH AND TURBIDITY

Batch I: Determination of turbidity of the given sample using nephelometer in NTU.
Batch II: To determine the pH of given samples using universal indicator, pH paper and digital pH meter.

Week-3	DTERMINATION OF TURBIDITY AND TOTAL DISSOLVED SOLIDS

Batch I: Determining the electrical conductivity of the given water sample.
Batch II: Determination of total dissolved solids of the sample.

Week-4	DETERMINATION OF CONDUCTIVITY AND TOTAL DISSOLVED SOLIDS

Batch I: Determination of total dissolved solids of the sample.
Batch II: Determining the electrical conductivity of the given water sample.

Week-5	**DETERMINATION OF ALKALINITY, ACIDITY OF WATER AND CHLORIDE IRON IN WATER.**
Batch I: Determining the amount of alkalinity present in the given samples & determine the acidity of the given sample of water. Batch II: Determine the quantity of iron present in the given sample of water & determining the amount of chloride present in the given water sample by Mohr's method.	
Week-6	**DETERMINATION OF ACIDITY AND CHLORIDE IRON IN WATER**
Batch I: Determine the quantity of iron present in the given sample of water & determining the amount of chloride present in the given water sample by Mohr's method. Batch II: Determining the amount of alkalinity present in the given samples & determine the acidity of the given sample of water	
Week-7	**DETERMINATION OF DISSOLVED OXYGEN AND NITRATES IN WATER**
Batch I: Determine the nitrate nitrogen of the given sample of water. Batch II: Determine the quantity of dissolved oxygen present in the given sample(s) by using modified Winkler's (Azide modification) method.	
Week-8	**DETERMINATION OF NITRATES AND DISSOLVED OXYGEN IN WATER**
Batch I: Determine the quantity of dissolved oxygen present in the given sample(s) by using modified Winkler's (azide modification) method Batch II: Determine the nitrate nitrogen of the given sample of water.	
Week-9	**DETERMINATION OF OPTIMUM DOSE OF COAGULANT IN WATER DEMAND AND COAGULANT OF CHLORINE DEMAND**
Batch I: Determining the optimum coagulant dosage for clarifying the given sample of water by using alum as the coagulant and performing the jar test experiment. Batch II : Determining the chlorine demand	
Week-10	**DETERMINATION OF COD IN WATER AND DETERMINATION OF CHLORINE DEMAND**
Batch I : Determining the chlorine demand Batch II: Determining the optimum coagulant dosage for clarifying the given sample of water by using alum as the coagulant and performing the jar test experiment.	
Week-11	**DETERMINATION OF TOTAL PHOSPHOROUS AND BOD**
Batch I: Determining the amount of B.O.D. exerted by the given sample Batch II: Determining the total phosphorus	
Week-12	**REVISION**
Batch I: Revision Batch II: Revision	

Reference Books:

1. Chuck Eastman, Paul Teicholz, Rafael Sacks, Kathleen Liston ―BIM HANDBOOK‖, Wiley, 2nd Edition, 2011

E-Text Books:

1. http://auvsp.edu.in/datastore/auwebsite/documents/libraryebookspdf/building-information-modeling.pdf