

**Course Title: ENVIRONMENTAL ENGINEERING LABORATORY****As per Choice Based Credit System (CBCS) scheme****SEMESTER:VII**

<b>Subject Code</b>	<b>17CVL76</b>	<b>IA Marks</b>	<b>40</b>
<b>Number of Lecture Hours/Week</b>	<b>1I+2P</b>	<b>Exam Marks</b>	<b>60</b>
<b>Total Number of Lecture Hours</b>	<b>40</b>	<b>Exam Hours</b>	<b>03</b>
<b>CREDITS -02</b>		<b>Total Marks- 100</b>	

**Course objectives:** This course will enable students,

1. To learn different methods of water & waste water quality
2. To conduct experiments to determine the concentrations of water and waste water
3. To determine the degree and type of treatment
4. To understand the environmental significance and application in environmental engineering practice

**Revised Bloom's Taxonomy (RBT) Level****L1,L2,L3**

1. Determination of pH, Acidity and Alkalinity
2. Determination of Calcium, Magnesium and Total Hardness.
3. Determination of Dissolved Oxygen.
4. Determination of BOD.
5. Determination of Chlorides
6. Determination of percentage of available chlorine in bleaching powder,
7. Determination of Residual Chlorine
8. Determination of Solids in Sewage:
  - I) Total Solids,
  - II) Suspended Solids,
  - III) Dissolved Solids,
  - IV) Volatile Solids, Fixed Solids,
  - V) Settle able Solids.
9. Determination of Turbidity by Nephelometer
10. Determination of Optimum Dosage of Alum using Jar test apparatus.
11. Determination of sodium and potassium using flame photometer.
12. Determination Nitrates by spectrophotometer.
13. Determination of Iron & Manganese.
14. Determination of COD. (Demonstration)
15. Air Quality Monitoring (Ambient, stack monitoring , Indoor air pollution)  
(Demonstration)
16. Determination of Sound by Sound level meter at different location(Demonstration)

**Course Outcomes:** After studying this course, students will be able to:

1. Acquire capability to conduct experiments and estimate the concentration of different parameters.
2. Compare the result with standards and discuss based on the purpose of analysis.

3. Determine type of treatment, degree of treatment for water and waste water.
4. Identify the parameter to be analyzed for the student project work in environmental stream.

**Program Objectives:**

1. Evaluation of the test results and assesses the impact on water and waste water treatment.
2. Train student to undertake student project work in 8<sup>th</sup> semester in the field of environmental engineering.

**Question paper pattern:**

1. Two experiments shall be asked from the above set
2. One experiment to be conducted and for the other student should write detailed procedure.

**Reference Books:**

1. Lab Manual, ISO 14001 Environmental Management, Regulatory Standards for Drinking Water and Sewage disposal
2. Clair Sawyer and Perry McCarty and Gene Parkin, "Chemistry for Environmental Engineering and Science", McGraw-Hill Series in Civil and Environmental Engineering