# ENGINEERING CHEMISTRY LAB

Common to ECE, CSE, IT, CSE(AI&ML) & CSE(DS) Branches

| 21CH106BS/21CH206BS | L | T | P | C |
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**Course Objectives:** The course consists of experiments related to the principles of chemistry required for engineering student. The student will learn:

1. Estimation of hardness in water and amount of Iron in given solutions.
2. To estimate the strength of solutions by instrumental methods.
3. The measurement of physical properties like surface tension and viscosity.
4. To synthesize the drug molecules and preparation of hand sanitizer.

**Course Outcomes:** The experiments will make the student gain skills on:

CO 1:Estimation of hardness in water and amount of Iron in given solution.
CO 2: Estimation of strength and amount of given solutions by instrumental methods.
CO 3: Determination of physical properties like surface tension and viscosity.
CO 4: Preparation of drug molecules and hand sanitizer.

**List of Experiments:**

**EXPERIMENT-I**

1. Estimation of amount of $Fe^{2+}$ by Permanganometry ($KMnO_4$).

**EXPERIMENT-II**

2. Estimation of amount of $Fe^{2+}$ by Dichrometry ($K_2Cr_2O_7$).

**EXPERIMENT-III**

3. Estimation of total hardness of water by complexometric method using EDTA.

**EXPERIMENT-IV**

4. Estimation of Alkalinity of given water sample.

**EXPERIMENT-V**

5. Estimation of amount of HCl by Conductometry.

**EXPERIMENT-VI**

6. Estimation of amount of Acetic acid by Conductometry.

**EXPERIMENT-VII**

7. Estimation of amount of HCl by Potentiometry.

**EXPERIMENT-VIII**

8. Estimation of amount of $Fe^{2+}$ by Potentiometry using $KMnO_4$.

**EXPERIMENT-IX**

9. Estimation of amount of Iron in cement by colorimetry.

**EXPERIMENT-X**

10. Estimation of amount of HCl by pH metry.

**EXPERIMENT-XI**

11. Determination of viscosity of castor oil and ground nut oil by using Ostwald's viscometer.

**EXPERIMENT-XII**

12. Determination of surface tension of a given liquid using stalagmometer.

**EXPERIMENT-XIII**

13. Synthesis of Aspirin / Paracetamol.

**EXPERIMENT-XIV**

14. Preparation of Hand Sanitizer.

**Note: Any 12 experiments are to be performed.**

**REFERENCES:**

1.Senior practical physical chemistry, B.D. Khosla, A. Gulati and V. Garg (R.Chand & Co., Delhi)

2.An introduction to practical chemistry, K.K. Sharma and D. S. Sharma (Vikaspublishing, N. Delhi)

3.Vogel's text book of practical organic chemistry 5$^{th}$ edition

4.Text book on Experiments and calculations in Engineering chemistry – S.S.Dara