

**DEPARTMENT OF HUMANITIES & SCIENCES**  
**ENGINEERING CHEMISTRY LAB**  
**COURSE OBJECTIVES & COURSE OUTCOMES**

**Course Objectives:** The course consists of experiments related to the principles of chemistry required for engineering student. The student will learn:

1. Develop skills to estimate the hardness of water and assess its suitability for drinking purposes.
2. Learn to perform acid-base estimations using various methods such as conductometry, potentiometry, and pH metry.
3. Gain hands-on experience in the preparation of synthetic polymers like Bakelite and nylon-6 in the laboratory.
4. Acquire techniques for evaluating lubricant properties, including saponification value, surface tension, and viscosity of oils.
5. Understand and apply analytical methods for testing and analyzing the quality of water and other materials in practical scenarios.

**Course Outcomes:** At the end of the course, the students will be able to:

**CO1:** Understand water treatment, specifically focusing on the hardness of water and the purification processes used in water treatment.

**CO2:** Study conductometry, potentiometry, and pH metry to determine the concentrations or equivalence points of acids and bases, helping students build a foundational understanding of these analytical techniques.

**CO3:** Understand plastics, focusing on the properties and characteristics of thermoplastics, with a specific emphasis on materials like Bakelite and Nylon 6, including their flexibility, moldability, and recyclability.

**CO4:** Estimate physical properties such as viscosity and acid value in oil samples. Students will learn how viscosity measures a fluid's resistance to flow and how it relates to the oil's internal friction.

**CO5:** Illustrate the construction of fuel cells, solar cells, and smart materials, equipping students with both theoretical knowledge and practical skills to understand and design these advanced materials and technologies.