



I Year-I Semester		L	T	P	C
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<b>APPLIED / ENGINEERING CHEMISTRY LABORATORY (R161122)</b>					

**Pre-requisites:** Students should have basic knowledge of chemistry laboratory.

**Course Description and Objectives:** The students entering into the professional course have practically very little exposure to lab classes. The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations; then they are exposed to a few instrumental methods of chemical analysis. Thus at the end of the lab course, the student is exposed to different methods of chemical analysis and use of some commonly employed instruments. They thus acquire some experimental skills.

**Course Outcomes:**

Upon completion of the course, the student will be able to achieve the following outcomes.

CO	Course Outcomes	POs
1	Analyze the need, design and perform a set of experiments	5
2	Learn and apply basic techniques used in chemistry laboratory for volumetric analysis; redox titrations with different indicators; EDTA titrations	5
3	Enhance the thinking capabilities in the modern trends in Engineering & Technology	8
4	Expose to different methods of chemical analysis and use of some commonly employed instruments.	4
5	Explain and demonstrate a few instrumental methods of chemical analysis	4
6	Function as a member of a team, communicate effectively and engage in further learning. Also, learn safety rules in the practice of laboratory investigations	7

**List of Experiments**

1. Introduction to Chemistry laboratory – Molarity, Normality, Primary, secondary standard solutions, Volumetric titrations, Quantitative analysis, Qualitative analysis, etc.
2. Trial experiment - Determination of HCl using standard  $\text{Na}_2\text{CO}_3$  solution.
3. Determination of alkalinity of a sample containing  $\text{Na}_2\text{CO}_3$  and NaOH.
4. Determination of  $\text{KMnO}_4$  using standard Oxalic acid solution.
5. Determination of Ferrous iron using standard  $\text{K}_2\text{Cr}_2\text{O}_7$  solution.
6. Determination of Copper using standard  $\text{K}_2\text{Cr}_2\text{O}_7$  solution.
7. Determination of temporary and permanent hardness of water using standard EDTA solution.



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8. Determination of Copper using standard EDTA solution.
9. Determination of Iron by a Colorimetric method using thiocyanate as reagent.
10. Determination of pH of the given sample solution using pH meter.
11. Conductometric titration between strong acid and strong base.
12. Conductometric titration between strong acid and weak base.
13. Potentiometric titration between strong acid and strong base.
14. Potentiometric titration between strong acid and weak base.
15. Determination of Zinc using standard EDTA solution.
16. Determination of Vitamin – C.

**REFERENCE BOOKS:**

1. A Textbook of Quantitative Analysis, Arthur J. Vogel.
2. Dr. Jyotsna Cherukuris (2012) *Laboratory Manual of engineering chemistry-II*, VGS Techno Series.
3. Chemistry Practical Manual, Lorven Publications.
4. K. Mukkanti (2009) *Practical Engineering Chemistry*, B.S. Publication.