Program : **Diploma in Engineering and Technology**	
Course Code : **1007**	Course Title: **Applied Chemistry Lab**
Semester : **1**	Credits: **1**
Course Category: **Basic Science**	
Periods per week: **2 (L: 0 T: 0 P: 2)**	Periods per semester: **30**

Course Objectives:

- To supplement the factual knowledge gained in the lectures by first hand manipulation of processes and apparatus.
- To develop scientific temper and help to apply the basic concepts and principles in solving engineering problems.

Course Prerequisites:

Topic	Program / Course Name
Basic knowledge in Chemistry	Secondary School

Course Outcomes:

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive Level
CO1	Quantitatively analyse solutions accurately.	8	Applying
CO2	Standardise EDTA and analyse the hardness of water	4	Applying
CO3	Determine the pH of solutions using different techniques.	4	Applying
CO4	Apply the principles of electrochemistry in quantitative analysis.	6	Applying
	Series Test	4	
	Open Ended Experiments / micro projects	4	

CO – PO Mapping

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3						
CO2	3	3			3		
CO3	3						
CO4	3						

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**To quantitatively analyse solutions accurately.**		
M1.01	Preparation of standard solution of oxalic acid.	2	Applying
M1.02	Standardisation of hydrochloric acid using standard sodium carbonate solution.	2	Applying
M1.03	Estimation of sodium hydroxide using standard hydrochloric acid.	2	Applying
M1.04	Determine the strength of given potassium hydroxide solution by titrating against standard oxalic acid solution.	2	Applying
CO2	**To standardise EDTA using $ZnSO_4$ and to analyse quantitatively the hardness of water.**		
M2.01	Standardisation of EDTA using $ZnSO_4$	2	Applying
M2.02	Volumetric estimation of total hardness of given water sample using standard EDTA solution.	2	Applying
	Series Test– I	2	
CO3	**To determine the pH of solutions using various techniques.**		
M3.01	pH meter	2	Applying
M3.02	Universal indicator pH test paper	2	Applying
CO4	**To apply the principles of electrochemistry in quantitative analysis.**		

M4.01	Determine the conductivity of a given water sample using conductometer.	2	Applying
M4.02	Verify the first law of electrolysis using copper sulphate solution and copper electrodes.	2	Applying
M4.03	Measurement of emf of electrochemical cell using Daniel cell.	2	Applying
	Series Test- II	2	
	Open ended experiment/microprojects	4	

Note: Experiments shall be conducted such that all COs are attained.
Minimum of 6 experiments (excluding open ended experiments/microprojects) shall be performed.
Compulsory for CIA
The CIA shall be arranged in first semester by the faculty in charge.
The ESE need to be conducted at the end of the first semester.

Text / Reference

T/R	Book Title/Author
T1	Text Book of Chemistry for Class XI & XII (Part-I, Part-II); N.C.E.R.T., Delhi, 2017-18.
R1	Dr. G. H. Hugar and Prof A. N. Pathak, Applied Chemistry Laboratory Practices, Vol. I and Vol. II, NITTTR, Chandigarh, Publications, 2013-14.
R2	Agnihotri, Rajesh, Chemistry for Engineers, Wiley India Pvt.Ltd., 2014.
R3	Jain & Jain, Engineering Chemistry, Dhanpat Rai and Sons; New Delhi

Online Resources

Sl.No	Website Link
1	https://vlabs.iitb.ac.in
2	https://vlab.amrita.edu