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.	12	Applying
CO2	Standardise EDTA and analyse the hardness of water	4	Applying
CO3	Determine the pH of solutions using different techniques.	4	Applying
CO4	Construct different electrochemical cells and apply the principles of quantitative analysis using instruments	6	Applying
	Series Test	4	

CO – PO Mapping

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	3						
CO2		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 make quantitative analysis of 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 solution using solution of hydrochloric acid using methyl orange indicator.	2	Applying
M1.04	Determine the strength of given potassium hydroxide solution by titrating against standard oxalic acid solution using phenolphthalein indicator.	2	Applying
M1.05	Standardisation of KMnO4 solution using standard ferrous sulphate solution.	2	Applying
M1.06	Estimation of Mohr's salt using standard KMnO4 solution.	2	Applying
CO2	**To standardise EDTA using ZnSO4 and to analyse quantitatively the hardness of water.**		
M2.01	Standardisation of EDTA using ZnSO4	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 construct different electrochemical cells used in developing batteries and apply the principles of quantitative analysis using instruments.**		
M4.01	Determine the conductivity of a given water sample.	2	Applying
M4.02	To verify the first law of electrolysis of copper sulphate using copper electrodes.	2	Applying
M4.03	Construction and measurement of emf of electrochemical cell (Daniel cell).	2	Applying
	Series Test- II	2	

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	www.chemguide.co.uk/atommenu.html (Atomic structure and chemical bonding)
2	https://www.wastewaterelearning.com/elearning/ (Water Treatment)
3	www.em-ea.org/guide%20books/book-2/2.1%20fuels%20and%20combustion.pdf (Fuel and Combustion)