Course Code				**23CHMAP233**			
Title of the Course				**PHYSICAL CHEMISTRY -I**			
Offered to: (Programme/s)				B.Sc. Hons Chemistry			
L	**0**	**T**	**0**	**P**	**2**	**C**	**1**
Year of Introduction:	**2024-25**			**Semester:**			**3**
Course Category:	**MAJOR**			**Course Relates to:**	**GLOBAL**		
Year of Revision:	**2024**			**Percentage:**			
Type of the Course:				**SKILL DEVELOPMENT**			
Crosscutting Issues of the Course :				Environment and Sustainability			
Pre-requisites, if any				**23CHMAP121, 23CHMAP122**			

Course Description:

Conductometric and potentiometric titrations are important techniques in Physical Chemistry, particularly for understanding the properties of solutions and reactions. Critical Solution Temperature of a partially miscible liquid system, such as phenol-water, by heating and cooling the mixture until it becomes homogeneous and then phase separates again. To measure the conductance of a solution during a titration to determine the endpoint, especially useful for titrations involving weak acids and bases. To determine the endpoint of a titration by measuring the potential (voltage) of the solution using an electrode.

Course Aims and Objectives:

S.NO	COURSE OBJECTIVES
1	Understand the concept of Critical Solution Temperature (CST) and its significance in the context of phase separation in solutions.
2	Understand The effect of NaCl (sodium chloride) on the Critical Solution Temperature (CST) depends on the system in question, particularly the nature of the solutes and solvents involved
3	Explain the fundamental principles behind conductometric titration, including the relationship between electrical conductivity and ion concentration.
4	Identify the equivalence point from the titration curve by analyzing changes in the slope of the conductivity data.
5	Able to determine unknown strength of acids by using conductometric titrations

Course Outcomes

At the end of the course, the student will be able to…

CO NO	COURSE OUTCOME	BTL	PO	PSO
CO1	Remember the use of glassware, equipment and chemicals and follow experimental procedures in the laboratory.	K1	PO1	PSO1
CO2	Understand Principles and concepts of CST and conductometric titrations practically.	K2	PO2	PSO2
CO3	Apply concepts of Determination of concentration of mixture of acids by using strong base.	K3	PO7	PSO1
CO4	Understand Principles and concepts of Potentiometric titrations	K2	PO2	PSO1
CO5	Apply the concepts and procedures for conductometric & potentiometric titrations	K3	PO7	PSO2

For BTL: K1: Remember; K2: Understand; K3: Apply; K4: Analyze; K5: Evaluate; K6: Create

CO-PO MATRIX										
CO NO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3
CO1	2							2		
CO2		3							2	
CO3							2	1		
CO4		2						2		
CO5							3		2	

Use the codes 3,2,1 for High, Moderate and Low correlation Between CO-PO-PSO respectively

Syllabus

CST, Conductometric and Potentiometric Titrimetry **50 M**

1. Determination of CST for Phenol-water system.
2. Effect of electrolyte on CST.
3. Conductometric titration - Determination of concentration of HCl solution usingstandard NaOH solution.
4. Conductometric titration – Determination of concentration of CH3COOHSolution using standard NaOH solution.
5. **Conductometric titration- Determination of concentration of acid mixture using standard NAOH solution**

6. **Conductometric titration- determination of dissociation constant of Acetic acid**

7. Potentiometric titration-Determination of concentration of HCl using standard NaOH solution.

II. Co-curricular activities and Assessment Methods;

1) Continuous Evaluation: Monitoring the progress of student's learning

2) Class Tests, Worksheets and Quizzes

3) Presentations, Projects and Assignments and Group Discussions: Enhancescritical thinking skills and personality

4) SEMESTER -End Examination: critical indicator of student's learning and teachingmethods adopted by teachers throughout the SEMESTER.

III. List of reference books:

1) A Text Book of Quantitative Inorganic Analysis(3rd Edition) –A.I.Vogel

2) Web related references suggested by teacher.

References-weblinks

1. **https://www.scribd.com/document/608058482/Applications-of-Conductometry-and-Potentiometry**
2. **https://www.metrohm.com/en_in/discover/blog/2024/conductometric-titration.html**
3. **https://mis.alagappauniversity.ac.in/siteAdmin/dde-admin/uploads/4/PG_M.Sc._Chemistry_34444-ADVANCED%20PHYSCIAL%20CHEMISTRY.pdf**

(A) Semester End Lab Examination

Course Code: 23CHMAP233

Title of the Course: PHYSICAL CHEMISTRY –I

Offered to: II BSC –Hons CHEMISTRY

Semester: III **Max.Marks: 50 (CIA+SEE)**

Max. Time: 3 Hrs

I. Answer the following. **Max. Marks: 30 Marks**

Q1 Determine the Effect of electrolyte on CST

II	**Viva**	**3 Marks**
III	**Record**	**2 Marks**

(B) CONTINUOUS ASSESMENT (Internal) **15 MARKS**

TOTAL: (A)+(B) = **50MARKS**