20MSC508P					Physical Chemistry-II Lab					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
0	0	3	1.5	3				50	50	100

COURSE OBJECTIVES

- To understand the concepts of electrochemistry for analytical purpose.
- To use the methods of science, in which quantitative, analytical reasoning techniques are used.
- To learn learn depth concepts about electrochemistry.
- To demonstrate the application of electrochemical methods in

LIST OF EXPERIMENTS

1. Conductometric titration of mixture of acids and precipitation titration (KCl Vs $AgNO_3$) using conductivity bridge.
2. Determination of the capacitance of electrochemical interfaces, formal potential and diffusion coefficient of $[Fe(CN)_6]^{3-}$ by cyclic voltammetry.
3. Determination of redox potential of Fe^{2+}/Fe^{3+} system by potentiometry.
4. Determination of strength of strong and weak acids in a given mixture conductrometrically,
5. Determination of ratio of Potasium Dicromate, chromate in a supplied mixture conductometric titrations.
6. Determination of cell constant of a cell and study the effect of dilution on equivalent conductance of strong/weak electrolytes.
7. Determination of equivalent conductance, degree of dissociation and dissociation constant of a weak acid like acetic acid.
8. Determination of percentage composition of a given acid mixture by pH metry.
9. Conducometric measurement of degree of hydrolysis of a salt.
10. Conductometric titration of a weak acid with strong base/mixture of strong and weak acid with strong base and weak acid with weak base.
11. Potentiometric titration of polyprotic acids with strong base/mixture of strong and weak acid with strong base.
12. Determination of pKa of weak acid/base/Determination of dissociation constants, pK1 and pK2 of a dibasic by potentiometry.
13. Determination of the isotherm for a three component system
14. To determine the critical micelle concentration of Sodium lauryl sulphate from the measurement of conductivities at different concentration
15. Determination of pKA and isoelectric point of an amino acid.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1– Apply the scientific process in the design, conduct, evaluation and reporting of experimental investigations

CO2–Derive essential mathematical relationships in kinetics and electrochemistry.

CO3- Define central parts of electrochemical cells and electrochemical equipment

CO4-Integrate qualitative and quantitative concepts of physical chemistry

CO5-Demonstrate procedures and instrumental methods applied in analytical and practical tasks of physical chemistry;

CO6-Solve problems in physical chemistry by using appropriate methodologies;

TEXT/REFERENCE BOOKS

1. C. W. Garland, J. W. Nibler, & D. P. Shoemaker, *Experiments in Physical Chemistry*, 8th Ed., McGraw – Hill, New York, 2003.
2. J. Mendham, R. C. Denney, J. B. Barnes & M. J. K. Thomas, *Vogel's Textbook of Quantitative Chemical Analysis*, 6th Ed., Pearson Education, New Delhi, 2003.
3. V.D. Athawale and P. Mathur, *Experimental Physical Chemistry*, 1st Edition, New Age International Publications, New Delhi 2001.
4. J.B.Yadav, *Advanced Practical Physical Chemistry*, Goel Publications, Meerut, 2003.

SEMESTER EXAMINATION PATTERN

Max. Marks: 100 **Exam Duration: 3 Hrs**

LW(Daily lab performance plus journal maintain each 25 marks)	50 Marks
LE (Viva-voce plus Lab examination each 25 marks)	50 Marks