

Course Type	Course Code	Name of Course	L	T	P	Credit
DP	NCYC521	Physical Chemistry Lab - I	0	0	3	1.5

Course Objective

- The idea of practical classes is to provide students an exposure to experimental laboratory, where they will experience how to perform an experiment properly based on their theoretical understanding.
- The practical syllabus is pertinent to the theoretical subjects the students are taught, viz. Thermodynamics, Quantum Chemistry and its application, Spectroscopy and Kinetics, so to provide students a correlation between theoretical knowledge and experiments.

Learning Outcomes

- The students will have a hands on experience with different instruments and learn the 'what is what' of that particular equipment. In this way the learning will be more effective.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Determination of thermodynamic parameters for micellization of SDS in aqueous solution Conductometrically	03	To gain the knowledge of thermodynamic parameter during micelle formation for surface active chemicals will be learned.
2	Study of fluorescence quenching of anthracene by CCl ₄ in n-hexane and ethanol & plot Stern-Volmer plot.	03	The students will have a basic understanding of fluorescence quenching.
3	Determination of molecular weight of polystyrene and effective spherical radius of BSA, using viscosity measurements.	03	It is a hand on experience by determination of molecular weight of polymers by very simple measuring physical properties like viscosity
4	Determination of the heat of neutralization	03	The student will learn thermochemistry principle by hand on experience
5	Kinetics of salt effect and ionic strength (persulphate-iodine reaction)	03	The basic understanding of Kinetics.
6	Determination of Pyrene excimer and exciplexes using steady state and time resolved fluorescence techniques.	03	The fundamental principle of steady state and time resolved fluorescence techniques will be learned by the studentss
7	Determination of thermodynamic parameter of a reaction from EMF experiments.	03	From this experiment variation of thermodynamic parameter will be understood
8	Study the adsorption of acetic acid by activated charcoal from aqueous solution.	03	Application of principle of adsorption will be understood
9	To verify the Walden's rule.	03	Effect of viscosity on conductance of ions will be learned
10	Study on the effect of extended conjugation on the wavelength of λ_{max} using different organic molecules => Benzene, Naphthalene, anthracene, as well as different cyanine dyes.	03	Students will learn the effect of extended conjugation and their physical properties.

11	Determination of activation energy and entropy of activation for acid catalyzed hydrolysis of ester..	03	Activation energy and entropy will be determined which students can learn from this experiment.
12	Preparation of Ag-np & verify via absorption/ emission	03	Students will learn nanoparticle synthesis.
13	Effect of solvent polarity or CMC determined by tensiometric method.	03	The practical knowledge of getting idea of CMC by tensiometric method
14	Determination of contact angles of different surfaces.	03	Students will learn the process to measure hydrophilicity/hydrophobicity
Total		42L	

Text Books:

1. Practical Physical Chemistry by B. Viswanathan and P.S. Raghavan, Viva Books, 2014.

Reference Books:

2. Advanced Practical Physical Chemistry, J. B. Yadav, 2005, Goel publishing House, Krishna Prakashan Media Ltd.