

Subject Code: 1PH1010202	Subject Title: PHARMACEUTICAL CHEMISTRY-II (PHYSICAL CHEMISTRY)
Pre-requisite Subject	- NONE -

Objectives of course: To understand the working and construction of basic instrument used for different chemical process. Illustration of calculation of half life, shelf life and expiry date using chemical kinetics.

Learning outcomes:

At the end of semester student will be able to:

1. Understand the fundamental concepts of chemistry lying emphasis on the physics.
2. Demonstrate understanding import thermodynamic state functions such as internal energy, enthalpy, entropy and Gibb's energy,
3. Analyze the equilibrium and the direction of spontaneous change in terms of the chemical potentials of substances, and the phase diagrams.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)					
Lecture	Tutorial	Practical	Credit	Theory(T)		Practical(P)		Total Marks	
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	Theory	Practical
3	0	3	6	80	20	80	20	100	100

Subject Contents			
Sr. No.	Topic	Total Hours	Weight (%)
1	The liquid state: Physical properties surface tension, parachor, viscosity, refractive index, optical rotation, dipole moment of chemical constituents.	7	16
2	Solutions: Ideal and real solutions, solutions of gases in liquids, colligative properties, partition co-efficient, conductance and its measurement, Debye Huckel theory.	8	18
3	Thermodynamics: Basic principles, First, Second and third laws, Zeroth Law, absolute temperature scale, thermo chemical equations, phase equilibria and phase rule, One and two component systems	9	20
4	Adsorption: Basic principles, Freundlich and Gibbs adsorption isotherms, Langmuir theory of adsorption.	4	8
5	Photochemistry: Basic principles, Consequence of light adsorption, Jablonski diagram, Lambert-Beer Law, Quantum efficiency.	6	14
6	Chemical kinetics: Zero, first and second orders reactions, complex reaction, theories of reaction kinetics, characteristics of homogeneous and heterogeneous catalysts, acid-base enzyme catalysis.	11	24

List of Experiments:

Practical exercises should be based on theoretical topics. The practical should broadly cover Hrs. the following:

- 1 Experiments on surface tension and viscosity, partition coefficient, adsorption, order of reaction (First and Second), refractive index and molar refraction should be covered. 45

List of References:

Reference books:

1. Schaum's Outline of Theory and Problems of Physical Chemistry: Clyde R. Metz, Tata McGraw-Hill Publishing Company Ltd., New Delhi. 2nd Ed. 2004.
2. Physical Chemistry: Keith J. Laidler, John H. Meiser, CBS Publishers & Distributors, New Delhi. 2nd Ed. 2006.
3. Martin's Physical pharmacy and pharmaceutical sciences: Sinco P J

Text Books:

1. Essentials of Physical Chemistry: Arun Bahl, B.S. Bahl, G.D. Tuli, S Chand & Co Ltd, 26th Ed. 2009.
2. Text book of Physical Chemistry: Samuel Glasstone, Macmillan India Limited, 2nd Ed. 1995.
3. Elements of Physical Chemistry; Peter Atkins, Julio de paula, Oxford University Press, 4th Ed. 2007.

e- Resources:

1. <http://www.chemistrylearning.com/adsorption-isotherm/>
2. <http://ocw.mit.edu/courses/chemistry/5-60-thermodynamics-kinetics-spring-2008/lecture-notes/>
3. <https://www.britannica.com/science/chemical-kinetics>
4. <http://chemistry.bd.psu.edu/jircitano/kinetics.html>
5. <https://www.boundless.com/chemistry/textbooks/boundless-chemistry-textbook/liquids-and-solids-11/>