

18BP032 PHYSICAL PHARMACEUTICS-I

Hours Per Week :

L	T	P	CP	CL
3	1	4	2	4

Total Hours :

L	T	P	WA/RA	SSH/HSH	CS	SA	S	BS
45	1	60						

SCOPE:

The course deals with the various physical and physicochemical properties, and principles involved in dosage forms/formulations. Theory and practical components of the subject help the student to get a better insight into various areas of formulation research and development, and stability studies of pharmaceutical dosage forms.

COURSE OUTCOMES:

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes	POs	PSOs
1	Understand the principles of physical chemistry in pharmaceutical technology	1,2	1,2
2	Understand various physicochemical properties of drug molecules in the designing the dosage forms	1,2	1,2
3	Know the principles of chemical kinetics & to use them for stability testing and determination of expiry date of formulations	1,2	1,2
4	Understand the use of physicochemical properties in the formulation development and evaluation of dosage forms.	1,2	1,2
5	Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.	1,2	1,2

UNIT-I**10HOURS**

SOLUBILITY OF DRUGS: Solubility expressions, mechanisms of solute solvent interactions, ideal solubility parameters, solvation & association, quantitative approach to the factors influencing solubility of drugs, diffusion principles in biological systems. Solubility of gas in liquids, solubility of liquids in liquids, (Binary solutions, ideal solutions) Raoult's law, real solutions. Partially miscible liquids, Critical solution temperature and applications. Distribution law, its limitations and applications.

UNIT-II**10HOURS**

STATES OF MATTER AND PROPERTIES OF MATTER: State of matter, changes in the state of matter, latent heats, vapor pressure, sublimation critical point, eutectic mixtures, gases, aerosols. Inhalers, relative humidity, liquid complexes, liquid crystals, glassy states, solid- crystalline, amorphous & polymorphism.

PHYSICOCHEMICAL PROPERTIES OF DRUG MOLECULES: Refractive index, optical rotation, dielectric constant, dipole moment, dissociation constant, determinations and applications.

UNIT-III**08HOURS**

SURFACE AND INTERFACIAL PHENOMENON: Liquid interface, surface & interfacial tensions, surface free energy, measurement of surface & interfacial tensions, spreading coefficient, adsorption at liquid interfaces, surface active agents, HLB Scale, solubilisation, detergency, adsorption at solid interface.

UNIT-IV**08HOURS**

COMPLEXATION AND PROTEIN BINDING: Introduction, Classification of Complexation, Applications, methods of analysis, protein binding, Complexation and drug action, crystalline structures of complexes and thermodynamic treatment of stability constants.

UNIT-V**07HOURS**

pH, BUFFERS AND ISOTONIC SOLUTIONS: Sorensen's pH scale, pH determination (electrometric and calorimetric), applications of buffers, buffer equation, buffer capacity, buffers in pharmaceutical and biological systems, buffered isotonic solutions.

