

Course Code	Course Title	Teaching Load			Marks		Exam (hrs)		Credits
		L	T	P	Int.	Ext.	Int.	Ext.	
BP403T	Physical Pharmaceutics-II	3	1	-	25	75	1	3	4

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.

Objectives: Upon the completion of the course, student shall be able to

1. Understand various physicochemical properties of drug molecules in the designing the dosage forms
2. Know the principles of chemical kinetics and to use them for stability testing and determination of expiry date of formulations
3. Demonstrate use of physicochemical properties in the formulation development and evaluation of dosage forms.

Module 01

07 Hours

Colloidal Dispersions

- Classification of dispersed systems and their general characteristics, size and shapes of colloidal particles, classification of colloids and comparative account of their general properties.
- Optical, kinetic and electrical properties. Effect of electrolytes, coacervation, peptization and protective action.

Module 02

10 Hours

Rheology

- Newtonian systems, law of flow, kinematic viscosity, effect of temperature, non-Newtonian systems, pseudoplastic, dilatant, plastic, thixotropy, thixotropy in formulation, determination of viscosity, capillary, falling Sphere, rotational viscometers.

Deformation of Solids

- Plastic and elastic deformation, Heckel equation, Stress, Strain, Elastic Modulus.

Module 03

10 Hours

Coarse dispersion

- Suspension, interfacial properties of suspended particles, settling in suspensions, formulation of flocculated and deflocculated suspensions.
- Emulsions and theories of emulsification, microemulsion and multiple emulsions; Stability of emulsions, preservation of emulsions, rheological properties of emulsions and emulsion formulation by HLB method.

Modul 04

10Hours

Micromeritics

- Particle size and distribution, mean particle size, number and weight distribution, particle number, methods for determining particle size by different methods, counting and separation method, particle shape, specific surface, methods for determining surface area, permeability, adsorption, derived properties of powders, porosity, packing arrangement, densities, bulkiness and flow properties.

Module 05

10 Hours

Drug Stability

- Reaction kinetics: zero, pseudo-zero, first and second order, units of basic rate constants, determination of reaction order.
- Physical and chemical factors influencing the chemical degradation of pharmaceutical product: temperature, solvent, ionic strength, dielectric constant, specific and general acid base catalysis, Simple numerical problems.
- Stabilization of medicinal agents against common reactions like hydrolysis and oxidation.
- Accelerated stability testing in expiration dating of pharmaceutical dosage forms. Photolytic degradation and its prevention.

Recommended Books: (Latest Editions)

1. Physical Pharmacy by Alfred Martin.
2. Experimental pharmaceuticals by Eugene, Parott.
3. Tutorial pharmacy by Cooper and Gunn.
4. Stocklosam J. Pharmaceutical calculations, Lea and Febiger, Philadelphia.
5. Liberman H.A, Lachman C., Pharmaceutical Dosage forms, Tablets, Volume-1 to 3, Marcel Dekkar Inc.
6. Liberman H.A, Lachman C, Pharmaceutical dosage forms. Disperse systems, volume 1, 2, 3. Marcel Dekkar Inc.
7. Physical Pharmaceutics by Ramasamy C, and Manavalan R.