

LJ UNIVERSITY

LJ INSTITUTE OF PHARMACY

SEMESTER: III

Subject Name: PHYSICAL PHARMACEUTICAL-II

Subject Code: BP301TP

Scope: The course deals with the various physical and physicochemical properties, and principals 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 completion of the course the student shall be able to

1. Understand various Physicochemical properties of drug molecules in the designing the dosage forms
2. Familiarize with the flow property and deformation of solid through Rheology
3. Understand the general principal, theory and stability studies of coarse dispersion – suspension and emulsion
4. Understand the theory, evaluation parameters of particle size, surface and its distribution through Micromeretics
5. Know the principles of Surface and Interfacial tension.

Teaching scheme and examination scheme:

Teaching Scheme				Evaluation Scheme			
Theory	Tutorial	Practical	Total	Theory		Practical	
				External	Internal	External	Internal
3	1	4	8	75	25	35	15

Sr. No.	Course Contents	Hours
1	Colloidal dispersions: Classification of dispersed systems & their general characteristics, size & shapes of colloidal particles, classification of colloids & comparative account of their general properties. Optical, kinetic & electrical properties. Effect of electrolytes, coacervation, Peptization & protective action.	07
2	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	10
3	Suspension: Suspension and interfacial properties of suspended particles, settling in suspensions, formulation of flocculated and deflocculated suspensions. Physical Stability of suspension, rheological properties of suspension.	05
4	Emulsion: Emulsions and theories of emulsification, Micro emulsion and multiple emulsions; Stability of emulsions, preservation of emulsions, rheological properties of emulsions and emulsion formulation by HLB method.	05
5	Micromeretics: 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 & flow properties.	10
6	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.	10
Total Hours		45

Practical

1. Determination of particle size, particle size distribution using Microscopic method
2. Determination of bulk density, true density and porosity
3. Determine the angle of repose and influence of lubricant on angle of repose
4. Determination of viscosity of liquid using Ostwald's viscometer
5. Determination sedimentation volume with effect of different suspending agent
6. Determination sedimentation volume with effect of different concentration of single suspending agent
7. Determination of viscosity of semisolid by using Brookfield viscometer
8. Determination of surface tension of given liquids by drop count and drop weight method
9. Determination of HLB number of a surfactant by saponification method
10. Determination of CMC of surfactants.

Recommended Books:

1. Physical Pharmacy by Alfred Martin
2. Experimental Pharmaceutics by Eugene, Parott.
3. Tutorial Pharmacy by Cooper and Gunn.
4. Stocklosam J. Pharmaceutical Calculations, Lea & 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.
8. Laboratory Manual of Physical Pharmaceutics, C.V.S. Subramanyam, J. Thimma setty
9. Physical Pharmaceutics by C.V.S. Subramanyam
10. Test book of Physical Pharmacy, by Gaurav Jain & Roop K. Khar