



SILVER OAK UNIVERSITY

Silver college of Pharmacy (067)

Programme Name: B.Pharm (18)

Subject Name: Physical Pharmaceutics II

Subject Code: 1180673208

Semester: IV

Prerequisite:

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.

Objective: Upon completion of this course the student should be able to:

1. Understand various physicochemical properties of drug molecules in the designing the dosage forms
2. Know the principles of chemical kinetics & 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

Teaching Scheme:

Teaching Scheme				
L	T	P	Contact Hours	Credit
3	1	4	8	6

Content:

Unit No.	Contents	Teaching Hours	Weightage %
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 Hrs	17%
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 Hrs	22%
3	Coarse dispersion: Suspension, interfacial properties of suspended particles, settling in suspensions, formulation of flocculated and deflocculated suspensions. 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	10 Hrs	17.77%

4	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 & flow properties.	10 Hrs	17.77%
5	Drug stability: Reaction kinetics: zero, pseudo-zero, first & 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 & general acid base catalysis, Simple numerical problems. Stabilization of medicinal agents against common reactions like hydrolysis & oxidation. Accelerated stability testing in expiration dating of pharmaceutical dosage forms. Photolytic degradation and its prevention	10 Hrs	16%
Total		45 Hrs	100%

Course Outcome: After Completion of Syllabus Students will able to

Sr. No.	CO statement	Unit No
CO-1	Have basic knowledge of pharmaceutical suspensions and colloids.	1
CO-2	Understand the physical properties of solutions, buffers, isotonicity, disperse systems and rheology. Describe the flow behavior of fluids.	2
CO-3	To demonstrate physicochemical characteristic of suspension and emulsion	3
CO-4	Understand various physicochemical properties of drug molecules in the designing the dosage form and in formulation research and Development	4
CO-5	Know the principles of chemical kinetics & to use them in assigning expiry date for Formulation	5

Teaching & Learning Methodology: -

The various methods or tools follows by the faculties to teach the above subject are:

1. Student centered learning
2. Experimental learning
3. Presentation learning

List of Tutorials/Experiments:

1. Determination of particle size, particle size distribution using sieving method
2. Determination of particle size, particle size distribution using Microscopic method
3. Determination of bulk density, true density and porosity
4. Determine the angle of repose and influence of lubricant on angle of repose
5. Determination of viscosity of liquid using Ostwald's viscometer
6. Determination sedimentation volume with effect of different suspending agent
7. Determination sedimentation volume with effect of different concentration of single suspending agent
8. Determination of viscosity of semisolid by using Brookfield viscometer

8. Determination of reaction rate constant first order.
9. Determination of reaction rate constant second order
10. Accelerated stability studies

Books Recommended

1. Alfred Martin Physical Pharmacy
2. Eugene, Parott Experimental Pharmaceutics .
3. Cooper and Gunn Tutorial Pharmacy
4. Lea & Febiger, Stocklosam J. Pharmaceutical Calculations, Philadelphia.
5. Liberman H.A, Lachman C., Pharmaceutical Dosage forms, Tablets, Volume-1 to 3, MarcelDekkar Inc.
6. Liberman H.A, Lachman C, Pharmaceutical Dosage forms. Disperse systems, volume 1, 2, 3. Marcel Dekkar Inc.
7. Ramasamy C and ManavalanR, Physical Pharmaceutics .
8. Laboratory Manual of Physical Pharmaceutics,
9. C.V.S. Subramanyam, J. Thimma settee, Physical Pharmaceutics by C.V.S. Subramanyam
10. Gaurav Jain & Roop K. Khar, Test book of Physical Pharmacy,

CO-PO-PSO Matrix:

Co. No.	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2
CO-1	3	1	2	3	2	2	-	2	2	3	3	3	3
CO-2	3	2	3	2	3	3	2	3	3	3	2	3	3
CO-3	3	1	2	2	-	1	-	1	-	2	2	2	2
CO-4	3	2	3	3	3	2	3	3	2	3	2	3	3
CO-5	3	2	3	2	2	2	2	2	3	3	3	2	3