

## Panipat Institute of Engineering and Technology, Panipat

### LESSON PLAN

**Subject:** Physical Pharmaceutics-II  
**Class:** B. Pharmacy, **Sem.:**4<sup>th</sup>

**Subject Code:** BP 403 T  
**Subject Incharge:** Dr. Daisy Arora

**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:**

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.

**Number of Lesson: 47**

**Each lecture: 01 hours (4 lectures per week)**

Chapter	Lesson No.	Particular	Remark/Date
<b>UNIT-I Colloidal dispersions (07 Hours)</b>	1.	Introduction about subject and Colloidal dispersions	
	2.	Classification of dispersed systems & their general characteristics	
	3.	Classification of dispersed systems & their general characteristics	
	4.	size & shapes of colloidal particles,	
	5.	classification of colloids & comparative account of their general properties.	
	6.	Optical, kinetic & electrical properties.	
	7.	Effect of electrolytes, coacervation, peptization & protective action.	
<b>UNIT-II Rheology</b>	8.	Newtonian systems, law of flow,	
	9.	kinematic viscosity, effect of temperature,	
	10.	non-Newtonian systems, pseudoplastic	
	11.	Dilatant, plastic, thixotropy,	
	12.	thixotropy in formulation	
	13.	determination of viscosity, capillary,	
	14.	falling Sphere, rotational viscometers	

	15.	Deformation of solids: Plastic and elastic deformation,	
	16.	Heckel equation, Stress Modulus	
	17.	Strain, Elastic Modulus	
<b>UNIT-III Coarse dispersion</b>	18.	Suspension; and.	
	19.	interfacial properties of suspended particles, , settling in suspensions	
	20.	formulation of flocculated and deflocculated suspensions.	
	21.	Emulsions and theories of emulsification,	
	22.	microemulsion	
	23.	multiple emulsions	
	24.	Stability of emulsions,	
	25.	preservation of emulsions,	
	26.	rheological properties of emulsions	
	27.	emulsion formulation by HLB method	
<b>UNIT-IV Micromeretics</b>	28.	Particle size and distribution	
	29.	mean particle size, number and weight distribution, particle number	
	30.	mean particle size, number and weight distribution, particle number	
	31.	methods for determining particle size by different methods	
	32.	methods for determining particle size by different methods	
	33.	counting and separation method	
	34.	particle shape, specific surface,	
	35.	methods for determining surface area,	
	36.	permeability, adsorption, derived properties of powders,	
	37.	porosity, packing arrangement,	
	38.	densities, bulkiness & flow properties.	
<b>UNIT-V Drug stability</b>	39.	Reaction kinetics: zero, pseudo-zero, first & second order.	
	40.	units of basic rate constants, determination of reaction order.	
	41.	Physical and chemical factors influencing the chemical degradation of pharmaceutical product:	
	42.	temperature, solvent, ionic strength, dielectric constant, specific & general acid base catalysis	
	43.	Simple numerical problems.	

	44.	Stabilization of medicinal agents against common reactions like hydrolysis & oxidation	
	45.	Accelerated stability testing in expiration dating of pharmaceutical dosage forms.	
	46.	Photolytic degradation and its prevention	
	47.	Revision of all the above topics with questioning and answering	

(Daisy Arora)  
Subject Teacher

(Dr. Gaurav Agarwal)  
Principal