PANIPAT INSTITUTE OF ENGINEERING AND TECHNOLOGY, PANIPAT

DEPARTMENT OF PHARMACY

Course: Bachelor in Pharmacy

LESSONPLAN

FacultyName: Dr. Seema Rohilla **Subject Name: Physical Pharmaceutics**

Class: B. Pharmacy –3rd Semester **SubjectCode: 302T**

Scope of the Subject: The course deals with the various physical, physicochemical properties and principle involved in dosage forms, formulations. Theory and practical components of the subject help the student to get a better insight in to various areas of formulation research and development and stability studies of pharmaceuticals.

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

1. Understand various physicochemical properties of drug molecules in the designing the dosage form
2. Know the principles of chemical kinetics & to use them in assigning expiry date for formulation
3. Demonstrate use of physicochemical properties in evaluation of dosage forms.
4. Appreciate physicochemical properties of drug molecules in formulation research and development

Number of Lectures: 45 **Each lecture**: 01 hour

Lecture No.	Particular	Remark/Date
Unit 1: Solubility of drugs		
1.	Solubility expressions, mechanisms of solute solvent interactions	
2.	Ideal solubility parameters, solvation & association	
3.	Quantitative approach to the factors influencing solubility of drugs,	
4.	Dissolution & drug release, diffusion principles in biological systems.	
5.	Solubility of gas in liquids, solubility of liquids in liquids	
6.	Binary solutions, ideal solutions	
7.	Raoult's law, real solutions,	
8.	Azeotropic mixtures, fractional distillation.	
9.	Partially miscible liquids, Critical solution temperature and applications.	
10.	Distribution law, its limitations and applications	
Unit 2: States of Matter and properties of matter		
11.	State of matter, changes in the state of matter	
12.	Latent heats, vapour pressure, sublimation critical point	
13.	Eutectic mixtures, gases, aerosols – inhalers	
14.	Relative humidity, liquid complexes, liquid crystals	
15.	Glassy states, solid-crystalline, amorphous & polymorphism.	
Physicochemical properties of drug molecules		
16.	Refractive index, optical rotation, dielectric constant	

17.	dipole moment, dissociation constant, determinations and applications	
Unit 3: Micromeretics		
18.	Particle size and distribution, average particle size, number and weight distribution, particle number	
19.	Methods for determining particle size by (different methods), counting and separation method	
20.	Particle shape, specific surface,	
21.	Methods for determining surface area, permeability, adsorption	
22.	Derived properties of powders	
23.	Porosity, packing arrangement, densities, bulkiness & flow properties	
Unit 4: Complexation and protein binding		
24.	Introduction, Classification of Complexation	
25.	Applications, methods of analysis, protein binding	
26.	Complexation and drug action, crystalline structures of complexes	
27.	Thermodynamic treatment of stability constants	
Unit 5: pH, buffers and Isotonic solutions		
28.	Sorensen's pH scale, pH determination (electrometric and calorimetric)	
29.	Applications of buffers, buffer equation, buffer capacity	
30.	Buffers in pharmaceutical and biological systems, buffered isotonic solutions	

Teacher in-charge **Principal**