Raffles University, Neemrana, Alwar, Rajasthan- 301705	
PREREQUISITES	
Course: Physical Pharmaceutics-II	**Number of Prescribed Hours: 45**
Academic Year: 2023-24 **Programme: B.Pharmacy**	
Name of Faculty: Ms. Deepika Yadav	**Year/Semester: 2Year IVSem**

TEACHING PLAN: PHYSICAL PHARMACEUTICS-II

SCHOOL: (SOP) School Of Pharmacy		**ACADEMIC SESSION: 2023– 2024**		**FOR STUDENTS' BATCH:**		
1	**Course No.**	**BP 403 T.**				
2	**Course Name**	**Physical pharmaceutics-II**				
3	**Credits**	**4 (3 Lectures+1Tutorial)**				
4	**Learning Hours**		**Theory hours**	**45**		
			Tutorial	**8**		
			Preparation and Exam	**3**		
			Flipped	**4**		
			SL/Al	**5**		
			Total hours	**65**		
5	**Course Objective**	Upon completion of this course the student should be able to: 1. Understand various physicochemical properties of drug molecules in thedesigning the dosage forms. 2. Know the principles of chemical kinetics & to use them for stability testing nad determination of expiry date of formulations. 3. Demonstrate use of physicochemical properties in the formulationdevelopment and evaluation of dosage forms.				3.
6	**Course Outcomes**	1. The course deals with the various physical and physicochemical properties, and principles involved in dosage forms/formulations. 2. 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.				
7	**Outline syllabus:**					
7.01	**Paper Code**		**Introduction Unit-1:**	**Lectures hours**	**Book tile**	**Page No.**
	BP403T	**Unit I**	**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**	Physical Pharmacy by Alfred Martin, Sixth edition.	386-409

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7.02	**BP403T**	**Unit II**	**Rheology:** 1. Newtonian systems, law of flow, kinematic viscosity, effect of temperature, non-Newtonian systems, pseudoplastic, dilatant, plastic. 2. thixotropy, thixotropy in formulation, determination of viscosity, capillary, falling Sphere, rotational viscometers. **Deformation of solids:** 1. Plastic and elastic deformation, Heckel equation, Stress, Strain, Elastic Modulus	**10**		469-491
7.03	**BP403 T**	**UNIT III**	**Coarse dispersion:** 1. Suspension, interfacial properties of suspended particles, settling in suspensions. 2. Formulation of flocculated and deflocculated suspensions. 3. Emulsions and theories of emulsification, microemulsion and multiple emulsions. 4. Stability of emulsions, preservation of emulsions. 5. Rheological properties of emulsions and emulsion formulation by HLB method.	**10**	Physical Pharmacy by Alfred Martin, Sixth edition	410-441
7.04	**BP403 T**	**UNIT IV**	**Micromeretics:** 1. Particle size and distribution, mean particle size, number and weight distribution, particle number. 2. Methods for determining particle size by different methods, counting and separation method, particle shape, specific surface. 3. Methods for determining surface area, permeability, adsorption. 4. Derived properties of powders, porosity. 5. Packing arrangement, densities, bulkiness & flow properties.	**10**	Physical Pharmacy by Alfred Martin, Sixth edition.	442-468
7.05	**BP403 T**	**UNIT V**	**Drug stability** 1. Reaction kinetics: zero, pseudo-zero, first & second order. 2. Units of basic rate constants, determination of reaction order.	**10**	Physical Pharmacy by Alfred Martin,	318-354

			3. Physical and chemical factors influencing the chemical degradation of pharmaceutical product: 4. Temperature, solvent, ionic strength, dielectric constant, specific & general acid base catalysis, Simple numerical problems. 5. Stabilization of medicinal agents against common reactions like hydrolys Accelerated stability testing in expiration dating of pharmaceutical dosage forms. 6. Photolytic degradation and its prevention & oxidation.		Sixth edition	

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8	**Course Evaluation**		
8.1	**Continuous Mode 10M (25%)**		
8.11	**Attendance**	4M (10%)	
8.12	Quiz, assignment open book test, field work, group discussion and seminar	6 Assignments and 3M (7.5%)	
8.13	Student – Teacher interaction	3M (7.5%)	
8.3	**End-term examination: 75%**		
9	**Text Books & References**		
9.1	**Text books and References**		
9.2	**Video References**		

QUESTION BANK

UNIT I: COLLOIDAL DISPERSION

1. Discuss the electrical properties and kinetic properties of colloids
2. Discuss the optical and electrical properties of colloids.
3. Discuss the kinetic and optical properties of colloids.

4. What are colloids? Give example. Explain any four methods of preparation of different types of colloids.
5. Explain different methods of preparation and purification of colloids.
6. Explain different purification methods and protection of colloids.

UNIT II: RHEOLOGY

1. Define and explain Non Newtonian flow of liquids.
2. Define Thixotropy. Explain different methods for its determination and give its application in pharmacy.
3. Define Viscosity. Classify different viscometers with examples. With the help of neat diagram explain the principle and working of any one single point viscometer.
4. Explain the principle of Ostwald's viscometer.
5. Explain the different methods to evaluate the stability of suspensions.
6. Define Rheology. Give applications of its.
7. Define microemulsions and multiple emulsions.
8. What is yield value? Give its applications.

UNIT III: COARSE DISPERSION

1. Explain in detail interfacial properties of suspended particles.
2. Discuss formulation parameters of suspension.
3. Discuss in detail the theories of emulsion.
4. Define emulsion. Explain in detail rheological properties of emulsions.
5. Explain the formulation of emulsion by HLB method.
6. Settling of suspensions.
7. Differentiate between flocculated and deflocculated suspensions.
8. Write a note on phase equilibrium in coarse dispersions.

UNIT IV: MICROMERITICS

1. How do you represent particle size distribution
2. With the help of neat diagram explain principle and working of coulter counter method to determine the particle size
3. What is specific surface area? How is it measured by air permeability method
4. What are derived properties of powders? Explain any two
5. Define angle of repose. Explain the method to determine the same
6. Explain porosity. Give its applications in pharmacy
7. Enumerate different methods of determination of true density and explain any one.
8. What is compressibility index and carr's index
9. What is bulk density and true density

UNIT V: DRUG STABILITY

1. Define stability studies. Explain in detail how the shelf life of pharmaceutical product is determined.
2. Define first order reaction with suitable examples.

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3. Define Zero order reaction with suitable examples.
4. Explain chemical degradation of pharmaceutical compounds due to hydrolysis. Explain its preventive measures.
5. Explain physical degradation of pharmaceuticals and its preventive measures.

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