

Institute/School Name	Chitkara College of Pharmacy		
Department Name	Pharmacy		
Programme Name	B.Pharmacy		
Course Name	Industrial Pharmacy-I	Session	July-Dec 2025
Course Code	BP502T	Semester/Batch	V/2023
L-T (Per Week)	3-1	Course Credits	4
Pre-requisite	Pharmaceutics basic knowledge	NHEQF Level¹	5.5
Course Coordinator	Dr. Neeraj Mittal		
SDG	3, 4, 9,12		

Objectives of the Course:

Upon completion of the course the student shall be able to know the various pharmaceutical dosage forms and their manufacturing techniques; know various considerations in development of pharmaceutical dosage forms and formulate solid, liquid and semisolid dosage forms and evaluate them for their quality.

Course Outcomes (COs)

Students should be able to:

	COs	Program Outcomes (PO)	NHEQF Level Descriptor	No. of Lectures
CO01	Understand the basic concept of preformulation studies and the physical and chemical characteristics of drugs.	1, 2, 3, 4, 6, 9	Q1	11
CO02	Acquire knowledge of various types of tablets, granulation processes, and formulation methods.	1, 3, 9, 11	Q2	7
CO03	Demonstrate the production, filling, and quality control tests for capsules and pellets.	1, 3, 4, 6, 9, 10	Q2, Q3	13
CO04	Describe liquid oral dosage forms and their evaluation methods.	1, 2, 6, 9, 11	Q5	3
CO05	Understand various parenteral and ophthalmic products, along with their evaluation.	1, 3, 4, 9, 10	Q4	11
CO06	Formulate various cosmetic products and perform stability studies.	1, 2, 3, 4, 6, 9, 11	Q6	13
Total Contact Hours				58

CO-PO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	Type of Assessment's
CO01	3	3	2	2		2			2			Summative/Formative
CO02	3		2						3		2	Summative/Formative
CO03	3		2	2		2			2	2		Summative/Formative
CO04	3	3				2			2		2	Summative/Formative
CO05	3		2	2					2	2		Summative/Formative
CO06	3	3	2	3		2			2		2	Summative/Formative

3=High, 2=Medium, 1=Low

Recommended Books:

B01: Theory and Practice of Industrial Pharmacy by Liberman and Lachman
B02: Pharmaceutical dosage form Parenteral medication, Liberman & Lachman, Vol 1 & 2.
B03: A handbook of Cosmetics, B.M Mithal & R.N. Saha
B04: Introduction to Pharmaceutical Dosage Forms, H. C. Ansel, Lea & Febiger, Philadelphia, 5th edition, 2005
B05: The Science and Practice of Pharmacy, Remington, 20th edition Pharmaceutical Science (RPS)
B06: Dispensing Pharmacy, RM Mehta, 4th Edition
B07: Pharmaceutics- The science of dosage form design by M.E.Aulton, Churchill livingstone.

Other readings and relevant websites:

S. No	Link of Journals, Magazines, websites and Research Papers
1.	Jindal K, Narula M (2018). Consideration of Pre-Formulation Parameters to Develop Solid Dosage Form. International Journal of Science and Research.1-6
2.	Vadaga AK, Gudla SS, Nareboina GS, Gubbala H, Golla B. Comprehensive Review of Modern Techniques of Granulation in Pharmaceutical Solid Dosage Forms. Intelligent Pharmacy. 2024 Jun 4.
3.	Naharro-Molinero A, Caballo-González MÁ, de la Mata FJ, García-Gallego S. Shell formulation in soft gelatin capsules: Design and characterization. Advanced Healthcare Materials. 2024 Jan;13(1):2302250.
4.	Drug Development and Industrial Pharmacy
5.	Journal of Pharmaceutical Sciences

Lecture Plan

Lect. No.	Topics	Book No, CH No, Page No	TLM	ALM	Web References	Audio-Video
1-11	<p>Preformulation Studies: Introduction to Preformulation, goals and objectives, study of physicochemical characteristics of drug substances.</p> <p>Physical properties: Physical form (crystal & amorphous), particle size, shape, flow properties, solubility profile (pKa, pH, partition coefficient), polymorphism.</p> <p>Chemical Properties: Hydrolysis, oxidation, reduction, racemization, polymerization.</p> <p>BCS classification of drugs & its significant.</p> <p>Application of Preformulation considerations in the development of solid, liquid oral and parenteral dosage forms and its impact on stability of dosage forms.</p>	B01, CH 8, Page no. 171-196	Lecture, Active learning, Discussion, Questioning	Group Discussion, Student-Created Ppt, Quiz/Test Questions	https://books.rsc.org/books/eedited-volume/38/chapter/45951/Preformulation-Studies#	
12-18	<p>Tablets: Introduction, ideal characteristics of tablets, classification of tablets.</p> <p>Excipients, Formulation of tablets, granulation methods, compression and processing problems. Equipment's and tablet tooling.</p> <p>Tablet coating: Types of coating, coating materials, formulation of coating composition, methods of coating, equipment employed and defects in coating.</p> <p>Quality control tests: In process and finished product</p>	B01, CH 11, Page no. 293-345 B01, CH 12, Page no. 346-373	Lecture, Active learning, Discussion, Questioning	Group Discussion, Student-Created Ppt, Quiz/Test Questions	https://www.ptsalipur.org/wp-content/uploads/2020/08/502T_IP2_UNIT-II.pdf	

19-21	Liquid orals: Formulation and manufacturing consideration of syrups and elixirs suspensions and emulsions; Filling and packaging; evaluation of liquid orals official in pharmacopoeia	B01, CH 15,16,17 , Page no. 457- 533	Lecture, Active learning, Discussion, Questioning	Group Discussion, Student-Created Ppt, Quiz/Test Questions	https://acop.edu.in/Material/PharmD/Pharmaceutical%20formulations/Unit%204/Liquid%20orals.pdf	
22-32	Capsules: Hard gelatin capsules: Introduction, Production of hard gelatin capsule shells. Size of capsules, Filling, finishing and special techniques of formulation of hard gelatin capsules, manufacturing defects. In process and final product quality control tests for capsules. Soft gelatin capsules: Nature of shell and capsule content, size of capsules, importance of base adsorption and minim/gram factors, production, in process and final product quality control tests. Packing, storage and stability testing of soft gelatin capsules and their applications.	B01, CH 13, Page no. 374- 411	Lecture, Active learning, Discussion, Questioning	Group Discussion, Student-Created Ppt, Quiz/Test Questions	https://www.ptsalipur.org/wp-content/uploads/2020/08/502T_IP2_UNIT-III.pdf	
33-34	Pellets: Introduction, formulation requirements, pelletization process, Equipment's for manufacture of pellets	B01, CH 5, Page no. 136- 150	Lecture, Active learning, Discussion, Questioning	Group Discussion, Student-Created Ppt, Quiz/Test Questions	https://columbiaiop.ac.in/own2022/Study%20Material/Pharmaceutical%20Pelle ts.pdf	
35-45	Parenteral Products: Definition, types, advantages and limitations. Preformulation factors and essential requirements, vehicles, additives, importance of isotonicity.	B01, CH 22, Page no. 639- 677	Lecture, Active learning, Discussion, Questioning	Group Discussion, Student-Created Ppt, Quiz/Test	https://www.ptsalipur.org/wp-content/uploads/2020/08/502T_IP2.pdf	

	Production procedure, production facilities and controls, aseptic processing. Formulation of injections, sterile powders, large volume parenteral and lyophilized products. Containers and closures selection, filling and sealing of ampoules, vials and infusion fluids. Quality control tests of parenteral products. Ophthalmic Preparations: Introduction, formulation considerations; Formulation of eye drops, eye ointments and eye lotions; methods of preparation; labeling, containers, evaluation of ophthalmic preparations			Questio ns	<u>UNIT-IV.pdf</u>	
46-54	Cosmetics: Formulation and preparation of the following cosmetic preparations: lipsticks, shampoos, cold cream and vanishing cream, tooth pastes, hair dyes and sunscreens. Pharmaceutical Aerosols: Definition, propellants, containers, valves, types of aerosol systems; formulation and manufacture of aerosols; Evaluation of aerosols	B03, Ch 6, Ch 18, Page no. 90, 199 B01, CH 20, Page no. 589-618	Lecture, Active learning, Discussion, Questioning	Group Discussion, Student-Created Ppt, Quiz/Test Questions	https://copbela.org/downloads/2022/SELF%20LEARN%20MATERIAL%20B%20PHARM%20Module/semester-5/BP502T/BP502T-5.pdf	
55-58	Packaging Materials Science: Materials used for packaging of pharmaceutical products Factors influencing choice of containers, legal and official requirements for containers, Stability aspects of packaging materials, quality control tests.	B01, CH 24, Page no. 711-732	Lecture, Active learning, Discussion, Questioning	Group Discussion, Student-Created Ppt, Quiz/Test Questions	https://www.scribd.com/document/63135852/Unit-5-Packaging-materials	