Elective					Pharmaceutical Technologies (22PCM216T)					
Teaching Scheme					Examination Scheme					
L	T	P	C	Hours/Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
2	0	0	2	2	25	50	25	--	--	100

COURSE OBJECTIVES

- Gain fundamental knowledge associated with pharmaceutical technologies and product development.
- Develop ideas of various techniques involved in pharmaceutical manufacturing.
- Learn, select and apply appropriate methods, procedures and resources.
- Understand the different dosage forms, manufacturing process, importance of quality control and stages of pharma product development.

UNIT I: Pharmaceutical preparations **6 Hr.**

Classification of Dosage forms I. Solid Dosage: Powders, Tablets, Capsules, and Granules. II. Semi solid Dosage: Creams, Gels, Ointment and Paste. III. Liquid Dosage: Monophasic (Syrups, Elixirs, Mouthwashes, drops), Biphasic liquids: Suspension, Emulsion. IV. Gas Dosage: Aerosols. Different routes of drug administration: Oral, Parenteral, Dermal, Nasal, Ocular, Rectal and their merits & demerits.

UNIT II: Pharmaceutical engineering **7 Hr.**

Principle and theories of various pharmaceutical process
Mixing: Double cone blender, ribbon blender, Sigma blade mixer and planetary mixers; Size reduction: Ball mill, fluid energy mill and Edge runner; Filtration: Frame filter, Meta filter, membrane filters and Seidtz filter; Drying: Tray dryer, drum dryer, spray dryer and fluidized bed dryer.

UNIT III: Pharmaceutical Manufacturing **7 Hr.**

Tablets: Formulation of tablets, Coating: film coating, enteric coating and micro-encapsulation, Quality control of tablets: Physical standards, Disintegration and Dissolution of tablets. Capsules: Hard and soft gelatin capsules, Filling, Storage and Quality control of capsules.

UNIT IV: Pharmaceutical product development **8 Hr.**

Pre-clinical studies: (Safety and Efficacy), Clinical studies (Phase I-IV), CDSCO- Regulatory requirements and approval, Drug distribution cycle.

Max. 28 Hr.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1: Gain fundamental knowledge of different pharmaceutical preparations.
CO2: Understand the principles and theories of pharmaceutical techniques.
CO3: Classify and compare various dosage forms and their applications.
CO4: Get acquainted with pharmaceutical manufacturing procedures and its quality control.
CO5: Focus professionally on pharmaceutical product development.

CO6: Design and develop solutions to pharmaceutical manufacturing problems

TEXT/REFERENCE BOOKS

1. Lachman Liebermans., "The Theory and Practice of Industrial Pharmacy", 4th Edition, CBS publisher (2020).
2. Loyd.V.Allen., " Ansel's Pharmaceutical Dosage Form and Drug Delivery System", 11th Edition, Wolters Kluwer India Pvt. Ltd publisher (2018).
3. Subrahmanyam, C.V.S., "Physical pharmaceutics", 3rd Edition, Vallabh Prakashan publisher (2015).
4. Carter, S.J., "Cooper and Gunn's Tutorial pharmacy", 12th Edition, CBS Publishers (2008).
5. Subrahmanyam, C.V.S., "Pharmaceutical engineering Unit operations principles and practices", Vallabh Prakashan publisher (2019).
6. Shivpuje, S.S., Singh, M.C. and Vishwe, P.S., "Pharmaceutics", Volume-1, Technical Publications (2009).
7. Globig, S. and Hunter Jr. W., "Pharmaceutical Technology", 1st Edition, Apple Academic Press (2012).
8. Parthasarathi G, Karin Nyfort-Hansen, Milap C Nahata. A textbook of Clinical Pharmacy Practice-essential concepts and skills, 1st ed. Chennai: Orient Longman Private Limited publisher (2004).

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks: 100	**Exam Duration: 3 Hr.**
Part A: 10 Questions each carrying 5 marks	50 Marks
Part B: 5 Questions each carrying 10 marks	50 Marks