

# 18BP098 ELECTIVE COURSE ON PHARMACEUTICAL PRODUCT DEVELOPMENT

Hours Per Week :

L	T	P	CP	CL
-	-	-	-	-

Total Hours :

L	T	P	WA/RA	SSH/SHS	CS	SA	S	BS
-	1	-						

**SCOPE:**

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**COURSE OUTCOMES:**

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes	POs	PSOs

**UNIT - I** **10HOURS**

**INTRODUCTION:** to pharmaceutical product development, objectives, and regulations related to preformulation, formulation development, stability assessment, manufacturing and quality control testing of different types of dosage forms

**UNIT - II** **10HOURS**

An advanced study of Pharmaceutical Excipients in pharmaceutical product development with a special reference to the following categories

- i. Solvents and solubilizers
- ii. Cyclodextrins and their applications
- iii. Non - ionic surfactants and their applications
- iv. Polyethylene glycols and sorbitols
- v. Suspending and emulsifying agents
- vi. Semi solid excipients

**UNIT - III** **10HOURS**

An advanced study of Pharmaceutical Excipients in pharmaceutical product development with a special reference to the following categories

- i. Tablet and capsule excipients
- ii. Directly compressible vehicles
- iii. Coat materials
- iv. Excipients in Parenteral and aerosols products
- v. Excipients for formulation of NDDS

Selection and application of excipients in pharmaceutical formulations with specific industrial applications

**UNIT - IV** **08HOURS**

Optimization techniques in pharmaceutical product development. A study of various optimization techniques for pharmaceutical product development with specific examples. Optimization by factorial designs and their applications. A study of QBD and its application in pharmaceutical product development.

**UNIT - V** **07HOURS**

Selection and quality control testing of packaging materials for pharmaceutical product development-regulatory considerations.

**RECOMMENDED BOOKS (LATEST EDITIONS)**

1. Pharmaceutical Statistics Practical and Clinical Applications by Stanford Bolton, Charles Bon; Marcel Dekker Inc.
2. Encyclopedia of Pharmaceutical Technology, edited by James Swarbrick, Third Edition, Informa Health care publishers.
3. Pharmaceutical Dosage Forms, Tablets, Volume II, edited by Herbert A. Liebermann and Leon Bachmann; Marcel Dekker, Inc.
4. The Theory and Practice of Industrial Pharmacy, Fourth Edition, edited by Roop Khar, S P Vyas, Farhan J Ahmad, Gaurav K Jain; CBS Publishers and Distributors Pvt.Ltd.2013.
5. Martin's Physical Pharmacy and Pharmaceutical Sciences, Fifth Edition, edited by Patrick J. Sinko, BI Publications Pvt.Ltd.
6. Targeted and Controlled Drug Delivery, Novel Carrier Systems by S. P. Vyas and R. K.Khar, CBS Publishers and Distributors Pvt. Ltd, First Edition 2012.
7. Pharmaceutical Dosage Forms and Drug Delivery Systems, Loyd V. Allen Jr., Nicholas B.Popovich, Howard C. Ansell, 9th Ed.40
8. Aulton's Pharmaceutics – The Design and Manufacture of Medicines, Michael E. Aulton, 3rd Ed.
9. Remington – The Science and Practice of Pharmacy, 20th Ed.
10. Pharmaceutical Dosage Forms – Tablets Vole 1 to 3, A. Libermann, Leon Bachmann and Joseph B. Schwartz
11. Pharmaceutical Dosage Forms – Disperse Systems Vole 1 to 3, H.A. Libermann, Martin, M.R and Gilbert S. Banker.
12. Pharmaceutical Dosage Forms – Parenteral Medication Vole 1 & 2, Kenneth E. Avis and H.A.Libermann.
13. Advanced Review Articles related to the topics.

