BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, Pilani
Pilani Campus
AUGS/ AGSR Division

SECOND SEMESTER 2018-19
COURSE HANDOUT

Date: 10/03/2021

In addition to part I (General Handout for all courses appended to the Time table) this portion gives further specific details regarding the course.

Course No : PHA G632
Course Title : Dosage Form Design
Instructor-in-Charge : Dr Anil Jindal
Instructor(s) : -
Practical Instructors: Mr. Rupesh, Mr. Atharva Rajendra Bhide, Mr. Rajesh Pradhan

1. Course Description: A study of physical and chemical, pharmacological and biopharmaceutic factors involved in the design and stability of dosage forms; transport of drugs across biological membranes; absorption, distribution and elimination of drugs; formulation additives, closures and containers and sustained release dosage forms; microencapsulation; radio pharmaceuticals.

2. Scope and Objective of the Course: It is a course intended to give the students an idea of various aspects of designing of different dosage forms particularly for new drugs, and factors to be considered for such designs, studies of effects of different additives used for designing different dosage forms. This course also deals with different controlled release delivery systems, aerosols, and various newer and novel modern drug delivery systems, packaging materials.

3. Text Books:

1. G.S. Banker and C.T. Rhodes, Modern Pharmaceutics, 4th Ed., Marcel Dekker Inc. New York;

4. Reference Books:

1. B.M. Mithal, A Text Book of Pharmaceutical Formulations, 6th ed., 1997, Vallabh Prakash, Delhi.
2. Y.W. Chien, Novel Drug Delivery Systems, 2nd ed. Marcel Dekker Inc., New York.
3. P.B. Deasy, Microencapsulation and Related Drug Processes, Marcel Dekker Inc.,New York.
4. J. Swarbrick, Current concepts in Pharmaceutical Sciences: Dosage Form Design, 1970 Lea & Fediger, Philadelphia.
5. R.L. Juliano, Drug Delivery Systems, 1980, Oxford Univ. Press, New York.
6. Prescott and Nimmo, Novel Drug Delivery, John Wiley & Sons, Chichesta.
7. B.T. Loftus and R.A. Nagh, Pharmaceutical Process Validation, Marcel Dekker Inc.,New York.
8. Lachmann, Liebermann and Kanig, The Theory & Practice of Industrial Pharmacy, K.M. Vergesh, 3rd Edition, 1990. New Delhi.
9. Remignton's Pharmaceutical Sciences.
10. P. Tyle, Drug Delivery Devices: Fundamentals and Applications; Marcel Dekker Inc, New York.
11. E.J. McNally, Protein Formulation and Delivery, Marcel Dekker Inc., New York.
12. P.Tyle, Specialized Drug Delivery Systems, Marcel Dekker Inc., New York.
13. Journal articles

5. Course Plan:

Module No.	Lecture Session	Reference	Learning outcomes
1	Introduction to Dosage Form Design: Preformulation studies & decision of Dosage Forms.	1 & 7	Introduction to different dosage forms and role of preformulation studies in dosage form design

2-4	Role of drug properties and route of administration in formulation development	Ref 5	Physicochemical properties of the drugs and biological factors for design and performance of dosage forms
5-8	Principles of drug absorption	T1-Ch 2 and 4	To understand the process of drug absorption: Drug absorption process, mechanisms involved and factors affecting the absorption of drug
9-13	Oral drug delivery and delivery systems	Ref 2	Gastric anatomy and dynamics, design of novel drug delivery systems for oral delivery
14-17	Parenteral drug delivery and delivery systems	Ref 02	Approaches for injectable drug delivery, case studies, biopharmaceutics, Implantable drug delivery systems
18-20	Microencapsulation	Ref 05	Fundamental considerations, methods and application of microencapsulation of drugs
21-24	Transdermal drug delivery systems	6	Skin permeation of drugs, technologies for design of transdermal drug delivery systems, advances in transdermal drug delivery systems
25-28	Ophthalmic drug delivery systems	13	Barriers of drug permeation, Methods to overcome barriers. Pharmacokinetics of ophthalmic formulations
29-32	Pulmonary drug delivery systems	Ref 6	Factor affecting pulmonary delivery of drugs, pharmacokinetic of pulmonary drug delivery, formulation considerations
33-36	Proteins and peptide drug delivery	22	Parenteral delivery of protein and peptides, biomedical application, non-invasive routes for protein and peptide drug delivery
37-40	Mucosal drug delivery systems	Ref 2	Nasal, buccal and sublingual drug delivery

6. Evaluation Scheme:

Component	Duration	Weightage (%)	Date & Time	Nature of component (Close Book/ Open Book)
Mid-Semester Test	90 Min.	30	<TEST_1>	Close and/or book
Comprehensive Examination	120 min	35	<TEST_C>	Close and/or Book
Project/Lab components/ Seminar/assignment	Continuous	35		-

a) It is strongly advised that all students prepare their own class notes and relevant information from text, reference material, as in handouts would only be allowed for consultation during assessments of open book/notes. Photocopies of any material, written or printed will not be permitted. Stapled sheets , loose sheets of information written or printed, photocopies of slides used for discussion in class will not be allowed.

b) Slides used during class hours provide key information for which additional supportive information is expected to be collected from sources aforementioned. These slides will not be shared and hence students are requested/advised to make their own notes during class hour.

c) For all evaluation components, information given during classroom instruction, aforementioned text books and reference books in the same order, will be considered as correct. Students are advised to follow the text, reference material as given in hand-out.

d) All evaluation components are equally important, irrespective of weightage. Hence, students failing to attend scheduled classes, or absenting themselves in one or many of the evaluation components, may become ineligible for obtaining a valid grade at the end of the semester. Attendance in lectures, tutorials and practicum experience are all equally important as they are all integral components of learning, irrespective of weightage and may be taken into consideration, during grading.

7. Chamber Consultation Hour: To be announced in class

8. Notices: Notice, if any, concerning the course will be displayed on the notice Board of Pharmacy Department Notice Board.

9. Make-up Policy: Make-Ups are not given as a routine. It is solely dependent upon the GENUINENESS OF THE CIRCUMSTANCES under which a student fails to appear in a scheduled evaluation component. In such circumstances, prior permission should be obtained from the Instructor-in-Charge. In no case the make-up letter be slipped inside the chamber of the Instructor-In-Charge. The decision of the Instructor- in-Charge will be final.

10. Note (if any): Nil

Instructor-in-charge
Course No. PHA G632