The University of Jordan

Faculty: Pharmacy
Department: Pharmaceutics and Pharmaceutical Technology
Program: BSc. of Pharmacy
Academic Year/ Semester: 2013/2014/ 1st semester
Course Name (Course Number): Selected Topics in Pharmaceutical Technology (1202538)

Credit hours	2	**Level**	5th Year	**Pre-requisite**	1202230
Coordinator/ Lecturer		**Office number**		**Office phone**	
Course website		**E-mail**		**Place**	

Office hours:					
Day/Time	**Sunday**	**Monday**	**Tuesday**	**Wednesday**	**Thursday**

Course Description

A discussion of processing and formulation strategies employed to optimize performance of dosage forms in terms of bioavailability with special emphasis on poorly soluble drugs.

Learning Objectives

1. To understand the performance requirements of a pharmaceutical dosage form.
2. To be able to compare the merits and cons of different drug delivery technologies
3. To recognize different mechanism through which a prodrug may be used to enhance dissolution and bioavailability proprtties.
4. To understand the different configurations of a solid solution/dispersion
5. To understand and compare between different processing methods of solid solution/dispersion
6. To know the different types of lipid based formulations

7. To understand the functionality and interaction of different excipients in lipid based drug delivery systems
8. To know the different processing techniques of solid self-emulsifying lipid based drug delivery systems

Intended Learning Outcomes (ILOs):

Successful completion of the course should lead to the following outcomes:

A. Knowledge and Understanding:

Student is expected to**:**

A1- Know different solubility and dissolution terms

A2- Understand the mechanism of drug dissolution

A3- Understand the energetic aspects of solubility and dissolution

A4- Be able to define a prodrug

A5-Understand the mechanisms by which a prodrug can improve solubility and bioavailability

A6- Understand the difference between the different classes of lipid formulations

A7- List the types of excipients involved in lipid formulations.

A8- Understand the mechanisms by which a lipid formulation improve drug bioavailability.

A9- Understand the difference between classes of solid solutions/dispersions.

A10- Understand the mechanisms by which a solid solution/dispersion improves drug bioavailability.

A11- Know the different types of carriers used in the preparation of solid solutions/dispersions

A12- Understand the bioavailability problems associated with drugs with a narrow absorption window.

A13- Know the different formulation classes for gastroretentive dosage forms.

B. Intellectual Analytical and Cognitive Skills: Student is expected to

B1- Be able to analyze data presented in technical reports and literature sources and relate them to dosage form performance.

B2- Be able to suggest formulations and manufacturing procedures to overcome bioavailability obstacles related to drugs physical and biopharmaceutical properties.

B3- Be able to critically evaluate the different formulation and processing strategies in terms of their feasibility and applicability when attempting to overcome bioavailability obstacles related to drugs physical and biopharmaceutical properties.

C. Subject-Specific Skills: Student is expected to

C1- be able to define problems in product development and suggest integrated strategy approaches for solving it.

C2-Be able to integrate data and information obtained using different techniques (in vitro and in vivo) to aid in decision making in product and process development.

D. Transferable Key Skills: Students is expected to

D1- Gain knowledge and analytical skills to work with people in pharmaceutical firms.

D2- Have the ability for quick adaptation to the working environment in pharmaceutical firms

D3- Have the ability to deal with and suggest solutions to the problems encountered during the manufacturing process of pharmaceutical dosage forms in pharmaceutical firms.

ILOs: Learning and Evaluation Methods

ILO/s	Learning Methods	Evaluation Methods
	Lectures and Discussions, Homework and Assignments, Projects, Presentation, …	Exam, Quiz, assignments, ...

Course Contents

Content	Reference *	Week	ILO/s **
1. Barriers to effective (oral) drug delivery: 2. Biopharmaceutical classification system and bioavailability. 3. Solubility and dissolution theory 4. Solubility and dissolution enhancement technologies: 4.1. Prodrugs 4.2. Solid solutions / dispersions 4.3. Self Emulsifying Systems Nanocrystals 5. In vitro evaluation of drug dissolution 5.1. Equipment 5.2. Media 5.3. IVIVC 6. Other approaches to optimize bioavailability 6.1. Gastroretentive systems		1 2 3-4 5-12 13-14 15-16	**A,B,C,D**

Learning Methodology

Lectures, Assignments, Seminars, Self-reading topics, etc.

Projects and Assignments

To be confirmed.

Evaluation

Evaluation	Point %	Date
Midterm Exam	30	Apporximately the 8th week
Quiz	10	To be agreed upon
Homework	10	Apporximately the 5th week

Final Exam	50	Apporximately the 16th week

Main Reference/s:

1. Physiological Pharmaceutics: Barriers to Drug Absorption, Neena Washington, Clive Washington, and Clive Wilson, Taylor & Francis Series in Pharmaceutical Sciences, 2000.
2. Modern Pharmaceutics, Volume 1: Basic Principles and Systems. Informa Health Care Series: Drugs and the Pharmaceutical Sciences. Alexander T. Florence and Juergen Siepmann, Fifth Edition, 2009.
3. Water-Insoluble Drug Formulation. Rong Liu. CRC; 2nd edition, 2008.
4. Pharmaceutical Dissolution Testing. Jennifer J. Dressman and Johannes Kramer. Informa HealthCare; 2005.