

The University of Jordan

Faculty: Pharmacy

Department: Pharmaceutics and Pharmaceutical Technology

Program: Master

Academic Year/ Semester: 2013-2014, 1st & 2nd Semesters

Course Name (Course Number): Advanced Physical Pharmacy (1232727)

Credit hours	3	Level	Master	Pre-requisite	Pharmacy degree
Coordinator/ Lecturer		Office number		Office phone	
Course website		E-mail		Place	

Office hours					
Day/Time	Sunday	Monday	Tuesday	Wednesday	Thursday

Course Description

In this course, the selected topics will be introduced in details, related problems will be solved and examples from published articles will be discussed. The course includes surfactants and surface activity, colloids and rheology. Basic thermodynamic relations will be introduced at the start of the course.

Learning Objectives

- To provide students with advanced understanding of the selected topics.
- To help the student to realize the inter-relation between the different factors affecting the physicochemical behavior of drugs in their formulations.
- To help the student to look at and learn from the practical experience of others, the articles were selected carefully in order to satisfy this objective.

Intended Learning Outcomes (ILOs):

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

A. Knowledge and Understanding: Student is expected

- A.1 To understand the meaning and the possible reasons for changes in thermodynamic functions of any process.
- A.2 To understand the reason for surface activity and factors affecting surfactant activity.
- A.3 To understand the phase behavior of surfactant containing systems.
- A.4 To understand the source of colloidal instability.
- A.5 To understand the meaning and reasons of the different flow behavior.

B. Intellectual Analytical and Cognitive Skills: Student is expected

- B1- To be able to predict at least the sign of the change in thermodynamic functions based on the possible interactions.
- B2 - To be able to rank compounds according to their surface activity based on their structure.
- B3- To understand the role of the surfactant/colloid electrical charge.
- B4- To be able to predict/explain the flow behavior of a formula based on the possible interactions between its components.

C. Subject-Specific Skills: Student is expected

- C1- To be able to construct binary and ternary surfactant containing phase diagrams.
- C2- To be able to design experimental plan for full characterization of a new surface active agent.
- C3- To be able to apply different experimental methods for the characterization of colloidal sols. The student also should be able to present and interpret the obtained results.

D. Transferable Key Skills: Students is expected

D1- To be able to read published articles and extract information from these papers for examinations or to be presented as seminars.

D2- To be aware of the available experimental methods for a specified property to be measured.

D3- To be aware of the expected difficulties/problems that he should consider when proposing/ carrying out any experimental plan.

D4- To be able to interpret the obtained results or at least to know where and how to look for possible explanations.

ILOs: Learning and Evaluation Methods

ILO/s	Learning Methods	Evaluation Methods
Knowledge and Understanding Intellectual Analytical and Cognitive Skills	Lectures	Exams, oral discussions
Subject-Specific Skills	Lectures and Discussions, Homework and Assignments, Projects, Presentation, ...	Quiz, presentation, project, assignments.
Transferable Key Skills	Lectures and Discussions, Homework and Assignments, Projects, Presentation, ...	presentation, project, assignments.

Course Contents

Content	Reference	Week or No. of lectures (1.5 each)
Partial differentiation		1 lecture
Thermodynamics-basics		5 lectures
Surfactant and Surface activity		8 lectures
Colloids		7 lectures
Rheology		7 lectures

Learning Methodology

Lectures, presentations, homework and exams.

Projects and Assignments

1. Students are asked to look in literature for one article with a thermodynamic treatment, read, understand, then discuss with the supervisor.
2. Before being discussed in the class, the students are required to read and understand articles selected by the supervisor, they will be asked about what they read in a written short exam.
3. Students are asked to write a short review article about a related topic and present it to the class.

Evaluation

Evaluation	Point %	Date
Midterm Exam	30	17 Nov 2013
Project	15	Dec 2013
Assignments	7	October 2013
Homework	4x2	Dec 2013
Final Exam	40	Jan 2014

Main Reference/s:

1. Published articles related to the discussed topics.
2. Surfactant Systems, D. Attwood and A.T. Florence. 1983, Chapman and Hall.
3. Physical Pharmacy, A. Martin, P. Bustamante and A.H.C. Chun, 4th Edition, 1993, Lea and Febiger.
4. Thermodynamics of Pharmaceutical Systems, Kenneth A. Connors, 2002, Wiley International.
5. Physico-Chemical Principles in Pharmacy, A.T Florence and D. Attwood, 1985, McMillan Publishing, London.
6. Pharmaceuticals: The Science of Dosage Form Design, Ed. M.E. Aulton, 1988, ELBS, London.
7. Bently's Textbook of Pharmaceutics, E. A. Rawlins, 8th Edition, 1984, ELBS, London.
8. Pharmaceutical Dosage Forms-Disperse Systems, Volumes 1&2. Ed. Herbert A. Lieberman, Martin M. Rieger and Gilbert S. Banker. 1988. Marcel Dekker, INC. New York and Basel.