Course Detailed Description – Procedures of the Course Plan Committee /Faculty of Pharmacy	QF02/0408-2.1E

Department	Pharmacy

Course Name	**Pharmaceutics-1**	**Course No.**	201221
Prerequisite		Credit Hours	3
Number & date of course plan approval	2016-2017	Brief Description	See form QF02/0409

Course Objective	1. To provide students with an understanding of the interpretive tools for pharmaceutical sciences. 2. To provide students with the ability to utilize the basic pharmaceutical principles in the design of pharmaceutical dosage forms. 3. To provide the students with an understanding of the solubility, diffusion, dissolution, kinetic reaction, colloidal systems, interfacial phenomenon and rheology. 4. To act as a link between the basic courses (General Chemistry, Organic Chemistry, Biochemistry and Physiology) and the more applied courses (Industrial Pharmacy, Biopharmaceutics and Pharmacokinetics).
Intended Learning Outcomes	• Students should be able to understand the solubility terms and factors affecting solubility. • Students should be able to determine the reaction order and rate in this course. Also they should be able to perform accelerated stability analysis and to calculate the half-life and shelf-life of various drugs formulations. • The student should understand the concepts of dissolution and diffusion analysis for the drug formulation. • The student should understand the concept of adsorption, spreading, and application of surface-active agents in the pharmaceutical formulation. • The student should be able to differentiate between Newtonian and non-Newtonian systems, and the influence of such rheological properties on pharmaceutical formulation.
Course Topics	• This course provides students with an introduction to the knowledge of physical pharmacy principles. • It will introduce the students to all the methods to prepare isotonic solution. This course will provide students with basic knowledge of solubility terms and distribution phenomena. • It will provide student with basic knowledge of kinetics, rates and orders of reactions, and accelerated stability studies.

	• It will cover subject of diffusion and dissolution. It will introduce students to interfacial phenomena, adsorption concepts, and applications of surface-active agents. It will introduce the student to colloidal systems. • It will introduce rheology and material classification according to rheological properties.
Textbooks	Alfred Martin, *Physical Pharmacy*: *Physical Chemical Principles in the Pharmaceutical Sciences*, sixth edition, Lea & Febiger, 2010.
References	• Jens T. Carstensen, *Advanced Pharmaceutical Solids*, Marcel Dekker, 2001. • Jens T. Carstensen, C. T. Rhodes, *Drug Stability: Principles and Practices,* third edition, Marcel Dekker, 2000. • A. T. Florence, *Physicochemical Principles of Pharmacy*, second edition, 1988. • E. L. Cussler, *Diffusion Mass Transfer in Fluid Systems*, Cambridge university press, 2009.

Grade Determination	1st Exam = 25% 2nd Exam = 25% Final Exam = 50%	Practical Course Grade Determination	Course Work = 50% (Reports, Term Papers, Quizes) Final Exam = 50%

Course Outline

Week	Hours	Subjects	Chapters in Textbook	Notes
1	1 2 3	• Introduction to physical pharmacy • Interpretive tools	1	
2	4 5 6	• Isotonic solution • Methods for preparation isotonic solutions	3	
3	7 8 9	• Solubility principles • Solvent-solute interactions • Solubility of gases in liquids	4	
4	10 11 12	• Solubility of liquids in liquids • Solubility of nonionic solids in liquids • Distribution of solutes between immiscible solvents	4	
5	13 14 15	• Introduction to chemical kinetics and orders of the reaction • Rates and orders of reactions	14	

Week	Hours	Subjects	Chapters in Textbook	Notes
6	16 17 18	• Influence of temperature and other factors on reaction rates • Kinetics in the solid state • Accelerated stability analysis	14	
7	19 20 21	• Definitions of diffusion • Fick's first law, second law	11	
8	22 23 24	• Fick's first law, second law • Procedure and apparatus	11	
9	25 26 27	• Definition of dissolution • Dissolution rate • Dissolution of tablet, capsules, and granules, and powder dissolution • Drug release	13	
10	28 29 30	• Liquid interface • Spreading • Adsorption at liquid interface	15	
11	31 32 33	• Adsorption at solid interface • Applications of surface active agents	15	
12	34 35 36	• Introduction to colloidal systems • Types of colloidal systems • Properties of colloids	16	
13	37 38 39	• Stability of colloidal systems • Solubilization	16	
14	40 41 42	• Introduction to rheology • Newtonian systems • non-Newtonian systems	19	
15	43 44 45	• Thixotropy • Negative thixotropy • Determination of rheological properties • Viscoelasticity	19	
16	46 47 48	• Final exams		

Approved by Dept. Chair		Date of Approval	

Extra Information: (Updated every semester and filled by course instructor)

Course Instructor	Dr. Rania Hamed
Office No.	418
Extension **Email**	471 Rania.hamed@zuj.edu.jo
Office hours	10-11 Sunday through Thursday