



كلية الصيدلة - جامعة الزيتونة الأردنية
Faculty of Pharmacy
Al-Zaytoonah University of Jordan
" نحو تعليم صيدلاني متميز "

Toward Excellence in Pharmaceutical
Education

الزيتونة الأردنية
Al-Zaytoonah University of Jordan
كلية الصيدلة
Faculty of Pharmacy



"Tradition and Quality"

Detailed Course Description - Course Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-3.0E
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Faculty	Pharmacy	Department	Pharmacy
Course number	0201221	Course title	Pharmaceutics I
Number of credit hours	3	Pre-requisite/co-requisite	Physical Pharmacy

Brief course description

This course is designed to introduce the students to the physicochemical principles behind the design and formulation of different pharmaceutical preparations, such as solubility, diffusion, dissolution, kinetics of reactions, colloidal systems, interfacial phenomena and rheology. These principles will lay the foundation for dosage form design and manufacture, as well as biopharmaceutics and pharmacokinetics.

Course goals and learning outcomes	
Goal 1	To introduce students to the principles behind the preparation of pharmaceutical solutions
Learning outcomes	1.1 Know how to prepare buffers and isotonic solutions. 1.2 Understand the factors controlling the solubility of nonionic solids in liquids. 1.3 Understand the distribution process and the importance of partition coefficient
Goal 2	To familiarize students with the kinetics of chemical reactions and their impact on stability
Learning outcomes	2.1 Define reaction rate, reaction order, and rate constants. 2.2 Calculate half-life and shelf life of pharmaceutical products. 2.3 Describe the influence of temperature on reaction rates and stability testing.
Goal 3	To introduce students to the various physicochemical phenomena and their pharmaceutical applications
Learning outcomes	3.1 Understand diffusion and dissolution and their applications. 3.2 Differentiate between the different types of interfaces and colloidal systems. 3.3 Learn the basic concepts of rheology.
Textbook	P.J. Sinko, Martin's Physical Pharmacy and Pharmaceutical Sciences, sixth edition, Lippincott Williams & Wilkins, 2011.
Supplementary references	1. Jens T. Carstensen, Advanced Pharmaceutical Solids, Marcel Dekker, 2001. 2. Jens T. Carstensen, C. T. Rhodes, Drug Stability: Principles and Practices, third edition, Marcel Dekker, 2000.



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3. A. T. Florence, Physicochemical Principles of Pharmacy, second edition, 1988.
4. E. L. Cussler, Diffusion Mass Transfer in Fluid Systems, Cambridge University Press, 2009.

Course timeline				
Week	Number of hours	Course topics	Pages (textbook)	Notes
01	1) Introduction to physical pharmacy	Ch. 1	
	1	) Interpretive tools	
	1	) Buffers and the buffer equation	
02	1) Tonicity definition	Ch. 8	
	1	) Class I methods for preparing isotonic solutions	
	1	) Class II methods for preparing isotonic solutions	
03	1) Definition of solubility	Ch. 9	
	1	) Solvent-solute interactions	
	1	) Solubility of liquids in liquids	
04	1) Solubility of nonionic solids in liquids	Ch. 9	
	1	) Thermodynamic solubility	
	1	) Distribution of solutes between immiscible solvents	
05	1) Introduction to chemical kinetics	Ch. 14	
	1	) Zero order reactions	
	1	) First order reactions	
06	1) Influence of temperature and other factors on reaction rates	Ch. 14	
	1	) Application of Arrhenius equation	
	1	) Accelerated stability testing	
07	1) Introduction to diffusion	Ch. 11	
	1	) Fick's first law	
	1			
08	1) Fick's second law	Ch. 11	
	1	) Applications of diffusion	
	1			
09	1) Definition of dissolution	Ch. 13	
	1	) Dissolution rate	
	1	) Drug release	
10	1) Introduction to interfacial phenomena	Ch. 15	
	1	) Types of interfaces	
	1	) Adsorption at liquid interfaces	
11	1) Adsorption at solid interface	Ch. 15	
	1) Measurement of interfacial tension		



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	1)	Wetting		
12	1)	Definition of colloidal dispersions	Ch. 16	
	1)	Types of colloidal systems		
	1	)	Properties of colloids	
13	1)	Stability of colloidal systems	Ch. 16	
	1	)	Applications of colloidal systems	
	1	)	Solubilization	
14	1)	Introduction to rheology	Ch. 19	
	1	)	Newtonian and non-Newtonian systems	
	1	)	Viscoelasticity	
15	1		Final exam		

Theoretical course evaluation methods and weight	First exam 25% Second exam 25% Final exam 50%	Practical (clinical) course evaluation methods	N/A
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Approved by head of department		Date of approval	
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Extra information (to be updated every semester by corresponding faculty member)

Name of teacher	Dr. Rania Hamed Dr. Suhair Sunoqrot	Office Number	225 (Dr. Rania Hamed) 228 (Dr. Suhair Sunoqrot)
Phone number (extension)	299 (Dr. Rania Hamed) 312 (Dr. Suhair Sunoqrot)	Email	rania.hamed@zuj.edu.jo suhair.sunoqrot@zuj.edu.jo
Office hours	Dr. Rania Hamed: Sunday, Tuesday, Thursday: 10:00 am – 11:00 am Monday, Wednesday: 11:00 am – 12:00 pm Dr. Suhair Sunoqrot: : Sunday, Tuesday, Thursday: 11:00 am – 12:00 pm Monday, Wednesday: 10:00 am – 11:00 am		