



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

" نحو تعليم صيدلاني متميز "  
Toward Excellence in Pharmaceutical  
Education

جامعة 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	0201541	Course title	Pharmaceutical Technology
Number of credit hours	3	Pre-requisite/co-requisite	Industrial Pharmacy

### Brief course description

This course is designed to introduce the students to the processes involved in the design, large scale manufacturing, and quality control of pharmaceutical preparations.

	Course goals and learning outcomes
<b>Goal 1</b>	To introduce students to solid oral dosage forms such as tablets and capsules
Learning outcomes	1.1 Know the importance of tablets as solid dosage forms, understand the mechanisms by which the machines work in tableting, know the additives used in tablet formulations, and the methods used to prepare tablets, understand technical problems associated with tableting and recognize methods used for quality control of tablets. 1.2 Understand the process of tablet coating, differentiate between different types of coatings, understand the problems associated with tablet coating. 1.3 Know the importance of capsules as solid dosage forms, differentiate between hard and soft gelatin capsules, understand methods used in capsule manufacturing and filling.
<b>Goal 2</b>	To introduce students to pulmonary and nasal drug delivery
Learning outcomes	2.1 Understand the mechanisms of aerosol deposition in the respiratory tract. 2.2 Differentiate between the different devices used for pulmonary drug delivery. 2.3 Know the requirements for nasal drug delivery and associated barriers.
<b>Goal 3</b>	To introduce students to nanotechnology and its importance for drug delivery
Learning outcomes	3.1 Know and understand the basic concept of nanotechnology and nanomedicine. 3.2 Know and understand the mechanisms of targeted drug delivery. 3.3 Differentiate between the different types of nanocarriers and their attributes.
<b>Textbook</b>	1. Aulton's Pharmaceutics; The Design and Manufacture of Medicines, by: M. E. Aulton. Third Edition. 2013. Churchill Livingstone. 2. Modern Pharmaceutics, vol.2, Applications and advances, A.T. Florence and J. Siepmann, 5th edn., 2009, Informa healthcare



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<b>Supplementary references</b>	<ol style="list-style-type: none"> <li>1. The Theory and Practice of Industrial Pharmacy, by: Leon Lachman, Herbert A. Lieberman and Hoseph L. Kanig. Third Edition. 1986.</li> <li>2. United States Pharmacopiea, 2010.</li> <li>3. British Pharmacopiea, 2010.</li> <li>4. Remingtons; Pharmaceutical Sciences, 2006.</li> </ol>
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**Course timeline**

Week	Number of hours	Course topics	Pages (textbook)	Notes
01	3	<b>Introduction, Industrial pharmacy terminology</b>	Ch. 30	
02	3	<b>Tablets:</b> Introduction and definition, properties of compressed tablets, tablets presses and compression cycle, Methods of tableting: direct compression, dry granulation, wet granulation and special procedures, forms of compressed tablets	Ch. 30	
03	3	<b>Tablets:</b> Technical problems during tableting, tablets additives (excipients)	Ch. 30	
04	3	<b>Tablets:</b> quality attributes and methods of tablet evaluation <b>Modified Release Dosage Forms:</b> Introduction and definition, methods of changing the availability rate, formulation and manufacture	Ch. 30 Ch. 31	
05	3	<b>Modified Release Dosage Forms:</b> types of sustained and controlled release dosage forms	Ch. 31	
06	3	<b>Tablet Coating:</b> Introduction and definition, advantages of coating, equipment and steps of sugar coating	Ch. 32	
07	3	<b>Tablet Coating:</b> Film coating (advantages, materials, process, film defects), other types of coating	Ch. 32	
08	3	<b>Capsules:</b> Introduction and definition, Hard gelatin capsules: manufacture, sizes and storage	Ch. 33	
09	3	<b>Capsules:</b> Hard gelatin capsule filling, locking and sealing, imprinting, evaluation of capsules	Ch. 33	
10	3	<b>Capsules:</b> formulation	Ch. 33	
11	3	<b>Capsules:</b> Soft gelatin capsules; introduction and definition, pharmaceutical applications	Ch. 34	
12	3	<b>Capsules:</b> Soft gelatin capsule; methods of manufacturing, nature of capsule shell, nature of capsule content	Ch. 34	
13	3	<b>Pharmaceutical aerosols:</b> pulmonary drug delivery using aerosols	Ch. 37	



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<b>14</b>	<b>3</b>	<b>Nasal drug delivery: advantages, types and formulations</b>	<b>Ch. 38</b>	
<b>15</b>	<b>3</b>	<b>Introduction to Nanotechnology</b>	<b>Ch. 45</b>	
<b>16</b>	<b>1</b>	<b>Final exam</b>		

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

<b>Name of teacher</b>	Dr. Nouf Mahmoud	<b>Office Number</b>	228
<b>Phone number (extension)</b>	312	<b>E-mail</b>	<a href="mailto:nouf.mahmoud@zuj.edu.jo">nouf.mahmoud@zuj.edu.jo</a>
<b>Office hours</b>	Sun, Tue: 11-12 Mon, Wed: 12:30-2:00 Thu: 12-1		