



Department	Pharmacy
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Course Name	Industrial Pharmacy	Course No.	201423
Prerequisite	Pharmaceutics -3-	Credit Hours	3
Number & date of course plan approval	2010-2011	Brief Description	See form QF02/0409

Intended Learning Outcomes	<p>Upon completion of this course the students should:</p> <ol style="list-style-type: none"> 1. Recognize importance of preformulation studies in drug formulation 2. Outline the design and mechanism of action of the instruments included in the unite operation in pharmaceutical practice. 3. Point out the principles of each unite operation in pharmaceutical processes. 4. Define the physical principle of each unite operation in industrial pharmacy. 5. Understand the concepts of pharmaceutical operations. 6. Review the use and application of each operation in relation to its advantages, disadvantages and mechanism of action. 7. Rationalize the use of the equipment for a specific application in pharmaceutical industry. 8. Predict the relationship between the equipment design and product characteristics. 9. Explain and discuss the use of different equipment to achieve certain operation in pharmaceutical industry. 		
Course Topics	<ol style="list-style-type: none"> 1. This course is aiming to provide an excellent introduction to the basic unite operations in the process of drug manufacturing. Both theoretical and practical information will be presented. 2. The subjects include preformulation, milling, particle size separation and analysis, powder flow, powder mixing, granulation, drying, clarification and filtration. 		
Text Books	<ol style="list-style-type: none"> 1. Alton's Pharmaceutics; The Design and Manufacture of Medicines, by: M. E. Aulton. Third Edition. 2007. Churchill Livingstone. 		
References	<ol style="list-style-type: none"> 1. The Theory and Practice of Industrial Pharmacy, by: Leon Lachman, Herbert A. Lieberman and Hoseph L. Kanig. Third Edition. 1986. 2. United States Pharmacopiea, 2010. 3. British Pharmacopiea, 2010. 4. Remingtons; Pharmaceutical Sciences, 2006. 5. Website(s): http://www.alzaytoonah.edu.jo/pharmacy/resources.html 		
Grade Determination	<input type="checkbox"/> 1 st Exam = 25% <input type="checkbox"/> 2 nd Exam = 25% <input type="checkbox"/> Final Exam = 50%	<input type="checkbox"/> Practical Course Grade Determination	<input type="checkbox"/> Course Work = 50% (Reports, Term Papers, Quizes) <input type="checkbox"/> Final Exam = 50%



Course Outline				
Week	Hours	Subjects	Chapters in Textbook	Notes
1		- preformulation: Organoleptic properties, Particle size, Crystallinity and polymorphism, Solubility analysis and dissolution		
2		- preformulation: pKa determinations, pH solubility profile, Stability analysis (solution stability and solid state stability).		
3		- Milling: Mechanisms involved, methods of size reduction in small and large scales, equipment classified according to the mechanism of action		
4		- Milling: Mechanisms involved, methods of size reduction in small and large scales, equipment classified according to the mechanism of action. (continued)		
5		- Particle Size Analysis: Equivalent diameters and particle size distribution. particle size analysis methods and selection of particle size analysis method		
6		- Particle Size Analysis: Equivalent diameters and particle size distribution. particle size analysis methods and selection of particle size analysis method. (continued)		
7		- Powder Flow: particles properties and bulk flow, packing geometry, methods used in powder flow characterization; direct and indirect, improvement of powder flowability.		
8		- Mixing: Fluid mixing (mechanisms, and equipment)		
9		- Mixing: Solid mixing (factors involved, and equipment) - emisolid mixing		
10		- Granulation: Dry Granulation (materials, methods, equipment),		
11		- Granulation: Wet Granulation (materials, methods, equipment)		
12		- Drying: Definition and purposes, mechanisms of drying, classification of solids based on drying behavior		
13		- Drying: Drying Equipments		
14		- Spray drying, Freeze drying		
15		- Clarification and Filtration: Factors affecting filtration, filter media and filter aids		
16		- Clarification and Filtration: Filtration equipment		

Approved by Dept. Chair		Date of Approval	
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Extra Information: (Updated every semester and filled by course instructor)

Course Instructor	
Office No.	
Extension	
Email	
Office hours	

