Detailed Course Description - Course Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-3.0E

Faculty	Pharmacy	Department	Pharmacy
Course number	201423	Course title	Industrial Pharmacy
Number of credit hours	3	Pre-requisite/co-requisite	Pharmaceutical 3

Brief course description
This course describes how the term has been interpreted for the purpose of this course and how pharmaceutics fits into the overall scheme of pharmaceutical science and the process of designing and manufacturing a new medicine. An understanding of the concept and design of various pharmaceutical dosage forms.

	Course goals and learning outcomes
Goal 1	Recognize importance of preformulation studies in drug formulation
Learning outcomes	1.1 Preformulation is the stage in drug and dosage form development before formulation proper 1.2 Preformulation aims to optimize the process of turning a drug candidate into a drug product 1.3 During preformulation, the physicochemical properties of drug candidates are determined
Goal 2	1. Understand the concepts of pharmaceutical operations.
Learning outcomes	2.1 The design and mechanism of action of the instruments included in the unite operation in pharmaceutical practice. 2. 2 Point out the principles of each unite operation in pharmaceutical processes. 2.3 Define the physical principle of each unite operation in industrial pharmacy.
Goal 3	Review the use and application of each operation in relation
Learning outcomes	3.1 advantages , disadvantages and mechanism of action. 3.2 Explain and discuss the use of different equipment to achieve certain operational pharmaceutical industry. 3.3 Predict the relationship between the equipment design and product characteristics
Goal 4	Explain and discuss Include preformulation, milling, particle size separation and analysis, powder flow, powder mixing, granulation, drying, clarification and filtration
Learning outcomes	4.1 The data generated at this stage allow decisions to be made on the likely ease of formulation of each drug candidate, indicate the most appropriate dosage form and highlight any potential issues with processability. 4.2 Formulation is the process of developing a drug candidate into a drug product. 4.3 In practice, the physicochemical properties of the molecule affect how a material will process pharmaceutically, its stability, its interaction with excipients, how it will transfer to solution and, ultimately, will determine its bioavailability.
Textbook	1.Alton's Pharmaceutics; The Design and Manufacture of Medicines, By; M. E.

	Aulton. Fifth edition. 2016. 2.The Theory and Practice of Industrial Pharmacy, Edited by. LEON LACHMAN, HERBERT A. LIEBERMAN, and JOSEPH L. KANIG. Lea & Febiger, 4th Edition. 2013.
Supplementary references	1. United States Pharmacopeia, 2016. 2. British Pharmacopeia, 2016. 3. Remington's; Pharmaceutical Sciences, 22nd 2013. Website(s): http://www.alzaytoonah.edu.jo/pharmacy/resources.htl

Course timeline				
Week	**Number of hours**	**Course topics**	**Pages (textbook)**	**Notes**
01	**1 1 1**	**preformulation:** Organoleptic properties, Particle size, Crystalinity and polymorphism, Solubility analysis and dissolution	Chapter 24	
02	**1 1 1**	**- preformulation:** pKa determinations, pH solubility profile, Stability analysis (solution stability and solid state stability).	Chapter 24	
03	**1 1 1**	**-Particle Size Analysis:** Equivalent diameters and particle size distribution. particle size analysis methods and selection of particle size analysis method	Chapter 9	
04	**1 1 1**	**-Particle Size Analysis:** Equivalent diameters and particle size distribution. Particle size analysis methods and selection of particle size analysis method. (continued)	Chapter 9	
05	**1 1 1**	**- Milling:** Mechanisms involved, methods of size reduction in small and large scales, equipment classified according to the mechanism of action	Chapter 10	
06	**1 1 1**	**- Milling:** Mechanisms involved, methods of size reduction in small and large scales, equipment classified according to the mechanism of action	Chapter 10	
07	**1 1 1**	**- Milling:** Mechanisms involved, methods of size reduction in small and large scales, equipment classified according to the mechanism of action. (continued)	Chapter 10	
08	**1 1**	-**Mixing**: Fluid mixing (mechanisms, and equipment)	Chapter 12	

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09	**1 1 1**	-**Mixing**: Solid mixing (factors involved, and equipment) - semisolid mixing	Chapter 12	
10	**1 1 1**	-**Granulation**: Dry Granulation (materials, methods, equipment),	Chapter 29	
11	**1 1 1**	-**Granulation**: Wet Granulation (materials, methods, equipment)	Chapter 29	
12	**1 1 1**	**-Drying:** Definition and purposes, mechanisms of drying, classification of solids based on drying behavior	Chapter 30	
13	**1 1 1**	-**Drying:** Drying Equipments	Chapter 30	
14	**1 1 1**	- Spray drying, Freeze drying	Chapter 30	
15	**1 1 1**	**-Clarification and Filtration:** Factors affecting filtration, filter media and filter aids	Chapter 26	
16	**1 1 1**	**-Clarification and Filtration:** Filtration equipment	Chapter 26	

Theoretical course evaluation methods and weight	First exam 25% Second exam 25% Final exam 50%	**Practical (clinical) course evaluation methods**	Semester students' work = 50% (Reports, research, quizzes, etc.) Final exam = 50%

Approved by head of department		**Date of approval**	

Extra information (to be updated every semester by corresponding faculty member)

Name of teacher	Dr.Abdulla El Madani	Office Number	**222**

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Office hours			