

Course Plan for Bachelor Program - Study Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-4.0E
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Study Plan No.	2021/2022		University Specialization		Bachelor of Pharmacy	
Course No.	0201220		Course Name		Pharmaceutics	
Credit Hours	3		Prerequisite *Co-requisite		Analytical Chemistry	
Course Type	☐ Mandatory University Requirement	☐ University Elective Requirement	☐ Faculty Mandatory Requirement	☐ Support course family requirements	☒ Mandatory Requirement	☐ Elective Requirement
Teaching Style	☐ Full Online Learning		☐ Blended Learning		☒ Traditional Learning	
Teaching Model	☐ 1 Synchronous: 1 Asynchronous		☐ 1 Face to Face: 1 Asynchronous		☒ 2 Traditional	

Faculty Member and Study Divisions Information (to be filled in each semester by the subject instructor)

Name	Academic rank	Office No.	Phone No.	E-mail	
Division number	Time	Place	Number of Students	Teaching Style	Approved Model
				Traditional Learning	2 Traditional

Brief Description

This course is designed to introduce students to the physicochemical principles underlying the design and formulation of various pharmaceutical preparations, such as solubility, diffusion, dissolution, reaction kinetics, colloidal systems, interfacial phenomena, and rheology. These principles will establish the foundation for dosage form design and manufacturing, as well as biopharmaceutics and pharmacokinetics.

تم تصميم هذه المادة الدراسية لتعريف الطلبة بالمبادئ الفيزيائية والكيميائية التي تقوم عليها عملية تصميم وتحضير المستحضرات الصيدلانية المختلفة، مثل الذائبية، الانتشار، الانحلال، حركية التفاعلات، الأنظمة الغروية، الظواهر السطحية وسيولة وانسيابية المواد. تشكل هذه المبادئ الأساس لتصميم الأشكال الصيدلانية وتصنيعها، بالإضافة إلى علم الصيدلة الحيوية وحركية الدواء.

Learning Resources

Course Book Information (Title, author, date of issue, publisher ... etc)	Sinko, Patrick J. 2023. Martin's Physical Pharmacy and Pharmaceutical Sciences. 8 th ed. Lippincott Williams & Wilkins.			
Supportive Learning Resources (Books, databases, periodicals, software, applications, others)	- Allen, L. V., Jr., & McPherson, T. B. (2023). <i>Ansel's pharmaceutical dosage forms and drug delivery systems</i> (12th ed.). Lippincott Williams & Wilkins. - Taylor, K. M. G., & Aulton, M. E. (Eds.). (2021). <i>Aulton's pharmaceutics: The design and manufacture of medicines</i> (6th ed.). Elsevier.			
Supporting Websites				
The Physical Environment for Teaching	☒ Classroom	☐ Labs	☒ Virtual Educational Platform	☐ Others
Necessary Equipment and Software	- Moodle.			
Supporting People with Special Needs				

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For Technical Support	E-Learning & Open Educational Resources Center. Email: ellearning@zu.edu.jo ; Phone: +962 6 429 1511 ext. 425/362.
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Course learning outcomes (K= Knowledge, S= Skills, C= Competencies)

No.	Course Learning Outcomes	The Associated Program Learning Output Code
Knowledge		
The student should be able to:		
K1	Define buffers, tonicity, solubility, diffusion, dissolution, distribution, interfacial tension, colloidal dispersions, and rheology.	MK2
K2	Identify different orders of chemical reaction decomposition and the factors affecting these reactions.	MK2
K3	Recognize the relationship between diffusion, dissolution, drug release, and absorption.	MK2
Skills		
The student should be able to:		
S1	Perform the calculations needed to prepare buffered isotonic solutions.	MS4
S2	Determine the order of decomposition reactions of pharmaceutical dosage forms and their respective shelf-lives and half-lives based on reaction kinetics.	MS4
S3	Apply the appropriate equations to predict drug solubility, distribution, extraction, drug release, and transport across biological barriers.	MS4

Mechanisms for Direct Evaluation of Learning Outcomes

Type of Assessment / Learning Style	Fully Electronic Learning	Blended Learning	Traditional Learning (Theory Learning)	Traditional Learning (Practical Learning)
Midterm Exam	30%	30%	30%	0%
Participation / Practical Applications	0%	0%	30%	60%
Asynchronous Interactive Activities	30%	30%	0%	0%
Final Exam	40%	40%	40%	40%

Note 1: Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, and work within student groups ... etc, which the student carries out on his own, through the virtual platform without a direct encounter with the subject teacher.

Note 2: According to the Regulations of granting Master's degree at Al-Zaytoonah University of Jordan, 40% of final evaluation goes for the final exam, and 60% for the semester work (examinations, reports, research or any scientific activity assigned to the student).

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Schedule of Simultaneous / Face-to-Face Encounters and their Topics

Week	Subject	Learning Style*	Reference **
1	Buffered and isotonic solutions	Lecture	Ch. 7, pp. 167-187
2	Buffered and isotonic solutions	Lecture Problem-based learning	Ch. 7, pp. 167-187
3	Solubility and distribution phenomena	Lecture	Ch. 8, pp. 188-204
4	Solubility and distribution phenomena	Lecture Problem-based learning	Ch. 8, pp. 188-204
5	Chemical kinetics and stability	Lecture	Ch. 14, pp. 341-383
6	Chemical kinetics and stability	Lecture Problem-based learning	Ch. 14, pp. 341-383
7	Diffusion	Lecture	Ch. 12, pp. 281-317
8	Diffusion	Lecture Problem-based learning	Ch. 12, pp. 281-317
9	Drug release and dissolution Midterm Exam	Lecture	Ch. 13, pp. 318-340
10	Drug release and dissolution	Lecture Problem-based learning	Ch. 13, pp. 318-340
11	Interfacial phenomena	Lecture	Ch. 10, pp. 230-259
12	Interfacial phenomena	Lecture Problem-based learning	Ch. 10, pp. 230-259
13	Colloidal dispersions	Lecture	Ch. 21, pp. 577-608
14	Colloidal dispersions	Lecture	Ch. 21, pp. 577-608
15	Rheology	Lecture	Ch. 11, pp. 260-280
16	Final Exam		

* Learning styles: Lecture, flipped learning, learning through projects, learning through problem solving, participatory learning ... etc.

** Reference: Pages in a book, database, recorded lecture, content on the e-learning platform, video, website ... etc.

Schedule of Asynchronous Interactive Activities (in the case of e-learning and blended learning)

Week	Task / Activity	Reference	Expected Results
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