

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.	0201525	Course Name	Pharmaceutical Technology
Credit Hours	3	Prerequisite *Co-requisite	Pharmaceutical Dosage Forms (2)
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	
Office Hours (Days/Time)					
Division number	Time	Place	Number of Students	Teaching Style	Approved Model
				Traditional Learning	2 Traditional

Brief Description

This course describes how pharmaceuticals fits into the overall scheme of pharmaceutical science and the process of designing and manufacturing a new medicine. Students will also be introduced to the processes and equipment employed in the manufacturing of solid dosage forms on an industrial scale.

Learning Resources

Course Book Information (Title, author, date of issue, publisher ... etc)	Aulton's Pharmaceutics: The Design and Manufacture of Medicines, M. E. Aulton and K. M. G. Taylor, 6 th edition, 2022, Churchill Livingstone.
Supportive Learning Resources (Books, databases, periodicals, software, applications, others)	1. The Theory and Practice of Industrial Pharmacy, Edited by L. Lachman, H.A. Lieberman, and J.L. Kanig. 4 th edition, 2013, Lea & Febiger. 2. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems, L. V. Allen, 11 th edition, 2017, Lippincott Williams & Wilkins.
Supporting Websites	
The Physical Environment for Teaching	☒ Classroom ☐ Labs ☒ Virtual Educational Platform ☐ Others
Necessary Equipment and Software	- Moodle.
Supporting People with Special Needs	
For Technical Support	E-Learning & Open Educational Resources Center. Email: clearning@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	Recognize pharmaceutical processes in industrial pharmacy such as; preformulation, particle size analysis and reduction, granulation, mixing, drying, powder flow and tableting.	MK1
Skills		
The student should be able to:		
S1	Differentiate between different pharmaceutical equipment and apparatus used in various pharmaceutical processes.	MS4
Competencies		
The student should be able to:		
C1	Develop professional and personal performance through problem-solving cases and group discussion.	MC3

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	Introduction to the pharmaceutical industry	Lecture Participatory learning	pp. 1-5 Video on the E-learning platform
2	Preformulation studies	Lecture Participatory learning	pp. 367-393
3	Particle size analysis	Lecture Participatory learning	pp. 138-155
4	Particle size analysis	Lecture Participatory learning	pp. 138-155
5	Milling	Lecture Participatory learning	pp. 156-169
6	Powder flow	Lecture Participatory learning	pp. 189-200
7	Mixing	Lecture Participatory learning	pp. 170-186
8	Granulation	Lecture Participatory learning	pp. 465-486
9	Granulation Midterm Exam	Lecture Participatory learning	pp. 465-486
10	Drying	Lecture Participatory learning	pp. 487-503
11	Tablet manufacturing and excipients	Lecture Participatory learning	pp. 504-519
12	Tablet manufacturing and excipients	Lecture Participatory learning	pp. 504-519
13	Tablet coating	Lecture Participatory learning	pp. 566-578
14	Technical problems during tableting	Lecture Participatory learning	pp. 510-511, 539-547
15	Quality control of tablets	Lecture Participatory learning	pp. 527-532
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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