

Course Plan for Bachelor Program - Study Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-4.0E
---	----------------

Study Plan No.	2021/2022	University Specialization	Bachelor of Pharmacy
Course No.	0201526	Course Name	Pharmaceutical Technology Lab
Credit Hours	1	Prerequisite *Co-requisite	Dispensing Lab + *Pharmaceutical Technology
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	☒ 1 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)	Sunday, Tuesday, Thursday ()		Monday, Wednesday ()		
Division number	Time	Place	Number of Students	Teaching Style	Approved Model
				Traditional Learning	1 Traditional

Brief Description

This practical course provides the students with hands-on knowledge of the techniques used in the manufacture and quality control of solid dosage forms. These techniques include milling, particle size analysis, mixing, powder flowability, granulation, and tablet coating. Quality control tests such as disintegration, dissolution, hardness, friability, weight variation, and content uniformity will also be introduced.

Learning Resources

Course Book Information (Title, author, date of issue, publisher ... etc.)	Pharmaceutical Technology Lab Manual.			
Supportive Learning Resources (Books, databases, periodicals, software, applications, others)	Aulton's Pharmaceutics; The Design and Manufacture of Medicines, by: M.E. Aulton and K.M.G. Taylor. Sixth Edition. 2021. Elsevier Limited.			
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: ellearning@zu.edu.jo ; Phone: +962 6 429 1511 ext. 425/362			

Course Plan for Bachelor Program - Study Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-4.0E
---	----------------

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	Identify instruments used in each experiment for the relevant manufacturing stage.	MK2
K2	Discuss the quality control procedures involved in the manufacture of dosage forms.	MK2
K3	Recognize the GMP requirements for each manufacturing stage.	MK2
Skills		
The student should be able to:		
S1	Apply the appropriate calculations when analyzing the data generated by the instruments.	MS4
S2	Employ quality control test results to make appropriate manufacturing decisions.	MS4
S3	Apply GMP principles to all aspects of pharmaceutical manufacturing.	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).

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

Week	Subject	Learning Style*	Reference ** (Pages in Course Book)
1	Introduction and lab safety	Lecture, practical learning	--
2	Milling and particle size analysis	Lecture, practical learning	Lab manual Aulton's pp. 126-156

Course Plan for Bachelor Program - Study Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-4.0E
---	----------------

			Chapter 9 + 10
3	Powder mixing	Lecture, practical learning	Lab manual Aulton's pp. 156-172 Chapter 11
4	Powder flowability	Lecture, practical learning	Lab manual Aulton's pp. 172-184 Chapter 12
5	Granulation	Lecture, practical learning	Lab manual Aulton's pp. 463-484 Chapter 29
6	Drying	Lecture, practical learning	Lab manual Aulton's pp. 483-501 Chapter 30
7	Quality control of tablets: Friability testing	Lecture, practical learning	Lab manual Aulton's pp. 501-542 Chapter 31
8	Quality control of tablets: Hardness testing	Lecture, practical learning	Lab manual Aulton's pp. 501-542 Chapter 31
9	Quality control of tablets: Friability testing	Lecture, practical learning	Lab manual Aulton's pp. 501-542 Chapter 31
10	Quality control of tablets: Content uniformity	Lecture, practical learning	Lab manual Aulton's pp. 501-542 Chapter 31
11	Quality control of tablets: Weight variation	Lecture, practical learning	Lab manual Aulton's pp. 501-542 Chapter 31
12	Quality Control of Tablets: Dissolution testing	Lecture, practical learning	Lab manual Aulton's pp. 501-542 Chapter 31
13	Tablet and granules coating	Lecture, practical learning	Lab manual Aulton's pp. 558-574 Chapter 33
14	Check-out	-	-
15	Final Exam		
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
-	-	-	-