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.)	1. Pharmaceutical Technology Lab Manual. 2. Aulton's Pharmaceutics: The Design and Manufacture of Medicines, M.E. Aulton and K.M.G. Taylor, 4th edition, 2013.			
Supportive Learning Resources (Books, databases, periodicals, software, applications, others)	1. The Theory and Practice of Industrial Pharmacy, by: Leon Lachman, Herbert A. 2. Lieberman and Hoseph L. Kanig. Third Edition. 1986. 3. United States Pharmacopeia, 2010. 4. British Pharmacopeia, 2010			
Supporting Websites	-			
The Physical Environment for Teaching	☐ Classroom	☑ **Labs**	☐ Virtual Educational	☐ Others

			Platform	
Necessary Equipment and Software	Moodle			
Supporting People with Special Needs	-			
For Technical Support	E-Learning & Open Educational Resources Center Email: elearning@zuj.edu.jo; Phone: +962 6 429 1511 ext. 425/362			

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 the instruments used in each experiment and relate them to the right 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 the results of quality control tests in making manufacturing decisions.	**MS4**
S3	Follow GMP in all aspects of manufacturing.	**MS4**
Competencies **The student should be able to:**		
C1	Collaborate effectively with team members when performing the experiments and submitting the lab reports.	**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%	20%	**50%**
Asynchronous Interactive Activities	20%	20%	0%	**0%**
Final Exam	50%	50%	50%	**50%**

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. 138-169 Chapter 9 + 10
3	Powder mixing	Lecture, practical learning	Lab manual Aulton's pp. 170-186 Chapter 11
4	Powder flowability	Lecture, practical learning	Lab manual Aulton's pp. 187-199 Chapter 12
5	Granulation	Lecture, practical learning	Lab manual Aulton's pp. 465-486 Chapter 28
6	Drying	Lecture, practical learning	Lab manual Aulton's pp. 487-503 Chapter 29
7	Quality control of tablets: Friability testing	Lecture, practical learning	Lab manual Aulton's pp. 504-549 Chapter 30
8	Quality control of tablets: Hardness testing	Lecture, practical learning	Lab manual Aulton's pp. 504-549 Chapter 30
9	Quality control of tablets: Friability testing	Lecture, practical learning	Lab manual Aulton's pp. 504-549 Chapter 30
10	Quality control of tablets: Content uniformity	Lecture, practical learning	Lab manual Aulton's pp. 504-549 Chapter 30
11	Quality control of tablets: Weight variation	Lecture, practical learning	Lab manual Aulton's pp. 504-549 Chapter 30
12	Quality Control of Tablets: Dissolution testing	Lecture, practical learning	Lab manual Aulton's pp. 504-549 Chapter 30
13	Tablet and granules coating	Lecture, practical learning	Lab manual Aulton's pp. 566-582 Chapter 32

14	Check-out	**-**	**-**
15			
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
-	-	-	-