جامعــة الـزيتـونــة الأردنيــة
Al-Zaytoonah University of Jordan
كلية الصيدلة
Faculty of Pharmacy

" عراقة وجودة"
"Tradition and Quality"

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.	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)	Sunday, Tuesday, Thursday ()		Monday, Wednesday ()		
Division number	Time	Place	Number of Students	Teaching Style	Approved Model
				Traditional Learning	2 Traditional

Brief Description

This course describes how pharmaceutics 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 the 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, 5th Edition, 2017, Churchill Livingstone.
Supportive Learning Resources (Books, databases, periodicals, software, applications, others)	- The Theory and Practice of Industrial Pharmacy, Edited by L. Lachman, H.A. Lieberman, and J.L. Kanig. 4th Edition, 2013, Lea & Febiger. - Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems, L. V. Allen, 11th 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.

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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	Describe the functions of the different departments in the pharmaceutical industry.	MK2
K2	Differentiate between the different types of preformulation studies.	MK2
K3	Outline the procedures involved in particle processing such as particle size analysis, milling, mixing, granulation, and drying.	MK2
K4	Recognize the technical processes involved in large-scale manufacturing of oral solid dosage forms.	MK2
Skills		
The student should be able to:		
S1	Design the appropriate dosage form for a drug candidate based on preformulation studies.	MS4
S2	Break down the potential causes of technical problems during tablet manufacturing and suggest appropriate solutions.	MS4
S3	Perform quality control tests of oral solid dosage forms according to compendial requirements.	MS4
Competencies		
The student should be able to:		
C1	Relate the technical aspects of dosage form development to the provision of pharmaceutical care and patient education.	MC2
C2	Develop the tools needed to compete in the pharmaceutical industry.	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).

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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	Preformulation studies	Lecture Participatory learning	pp. 367-393
4	Particle size analysis	Lecture Participatory learning	pp. 138-155
5	Particle size analysis	Lecture Participatory learning	pp. 138-155
6	Milling	Lecture Participatory learning	pp. 156-169
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	Clarification and filtration	Lecture Participatory learning	pp. 406-415
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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