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.	**0201363**		**Course Name**		**Medicinal Chemistry Lab**	
Credit Hours	**1**		**Prerequisite *Co-requisite**		**Pharmaceutical Analysis Lab + *Medicinal Chemistry (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		☑ **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 explores the role of medicinal chemistry in drug synthesis. It addresses principles of drug chemical synthesis. This course is designed to enhance the student knowledge and ability to operate a chemical drug synthesis using known procedures. Students will learn chemical techniques to assign the identity of the chemical structure.

Learning Resources

Course Book Information (Title, author, date of issue, publisher ... etc)	- Practical medicinal Chemistry manual			
Supportive Learning Resources (Books, databases, periodicals, software, applications, others)	1. The Organic Chemistry of Drug Synthesis, Vol. 1-6, D. Lednicer and L. A. Mitscher, John Wiley and Sons. 2. United States Pharmacopeia, 2010. 3. British Pharmacopeia, 2010			
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: 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 processes of preparation of different drug classes using simple synthetic procedures.	**MK2**
K2	Outline the identification and assay techniques for different drug classes.	**MK2**
K3	Recognize the purification, chromatographic and characterization techniques that are correlated with drug synthesis.	**MK2**
Skills **The student should be able to:**		
S1	Explain the detailed reaction mechanisms that are taking place during drug synthesis.	**MS4**
S2	Assess the identity and content of active pharmaceutical ingredients of certain pharmaceutical formulas according to the pharmacopoeia.	**MS4**
S3	Examine the effectiveness of synthetic, purification and separation techniques on the purity of products.	**MS4**
Competencies **The student should be able to:**		
C1	Relate the synthetic, identification and assay processes performed to the production of high-quality medicines.	**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 **
1	Check-in	Lecture, lab-based learning	Lab Manual
2	Laboratory instructions and introduction	Lecture, lab-based learning	Lab Manual
3	Synthesis of Paracetamol	Lecture, lab-based learning	Lab Manual
4	Synthesis of Paracetamol-TLC	Lecture, lab-based learning	Lab Manual
5	Paracetamol Identification	Lecture, lab-based learning	Lab Manual
6	Assay of Paracetamol Tablets	Lecture, lab-based learning	Lab Manual
7	Synthesis of Aspirin-I	Lecture, lab-based learning	Lab Manual
8	Synthesis of Aspirin-II	Lecture, lab-based learning	Lab Manual
9	Assay of Chloramphenicol eye drops	Lecture, lab-based learning	Lab Manual
10	Synthesis of Benzocaine	Lecture, lab-based learning	Lab Manual
11	Purification of Benzocaine	Lecture, lab-based learning	Lab Manual
12	Determination of Furosemide content in Tablets	Lecture, lab-based learning	Lab Manual
13	**Final exam (practical)**	---	---
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
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