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.	**0201362**		**Course Name**		**Medicinal Chemistry (2)**	
Credit Hours	**3**		**Prerequisite *Co-requisite**		**Medicinal Chemistry (1) + *Pharmacology (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**
				Blended Learning	**1 Face to Face: 1 Asynchronous**

Brief Description

This course is a continuation of medicinal chemistry-1. It discusses the structure-activity relationships, chemistry, mode of action, and metabolism of some classes of therapeutic agents such as drugs affecting neurotransmission, the central nervous system (CNS) and the cardiovascular system (CVS).

Learning Resources

Course Book Information (Title, author, date of issue, publisher ... etc)	1. Foye's Principles of Medicinal Chemistry, 7th edition, Thomas L. Lemke and David A. Williams, Lippincott Williams & Wilkins, 2013. 2. Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry, 12th edition, J. N. Delgado and W. A. Remers, Lippincott-Raven, 2011.
Supportive Learning Resources (Books, databases, periodicals, software, applications, others)	1. The Organic Chemistry of Drug Design and Drug Action, 2nd edition, Richard B. Silverman, Elsevier, 2004. 2. Burger's Medicinal Chemistry and Drug Discovery, 6th edition, M. E. Wolff, 2003. 3. The Organic Chemistry of Drug Synthesis, Vol. 1-6, D. Lednicer and L. A.

	Mitscher, John Wiley and Sons. 4. Drug Design Cutting Edge Approaches Edited by Darren R. Flower			
Supporting Websites				
The Physical Environment for Teaching	☑ **Classroom**	☐ Labs	☑ **Virtual Educational Platform**	☐ Others
Necessary Equipment and Software	- PC/laptop with headphones and camera. - Data-show. - Microsoft Office. - Microsoft Teams. - Zoom Platform. - 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	Recognize the structure-activity relationships (SAR) for drugs affecting the neurotransmission, CNS and cardiovascular systems.	**MK2**
K2	Describe the basic chemical concepts that structurally affect the lipophilicity and water solubility of drugs acting on the nervous and cardiovascular systems.	**MK2**
K3	Identify the different pharmacological and chemical classes of drugs acting on neurotransmission, the CNS and the cardiovascular systems.	**MK2**
K4	Appraise the intermolecular binding interactions between drugs and target active sites	**MK2**
Skills **The student should be able to:**		
S1	Interpret the various changes of chemical structures of drugs on their pharmacological activities.	**MS4**
S2	Describe the strategies utilized to enhance the pharmacokinetic profiles of drugs, including water and lipid solubility.	**MS4**
S3	Compare the different pharmacological activities of drugs based on their chemical structures.	**MS4**
S4	Explain the variations in the biological activities of drugs as a consequence of their affinities towards their binding sites on protein targets.	**MS4**
Competencies **The student should be able to:**		
C1	Develop his/her professional and personal performance by	**MC3**

	continuously following-up lectures and submitting tasks on time.	

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	Course topics	Learning style*	Refrences**	Notes
1	**Drug Receptors Affecting Neurotransmission** Cholinergic Drugs. Cholinergic Drugs.	lecture	Textbook 1/ Chapter 9 (p309-339)	
2	Cholinergic Drugs. Anticholinergic Drugs. Anticholinergic Drugs.	lecture	Textbook 1/ Chapter 9 (p309-339)	
3	Adrenergic Drugs. Adrenergic Drugs. Adrenergic Drugs.	lecture	Textbook 1/ Chapter 10 (340-364)	
4	Antiadrenergic Drugs. Antiadrenergic Drugs. Antiadrenergic Drugs.	lecture	Textbook 1/ Chapter 10 (340-364)	

5	**Drugs Affecting the CNS-** Local Anesthetics Local Anesthetics. General anesthetics.	lecture	Textbook 1/ Ch.16 (p 508-539)	
6	Sedative hypnotics. Sedative hypnotics. Sedative hypnotics.	lecture	Textbook 1/ Ch.15 (p 485-507)	
7	Antiseizure drugs. Antidepressants. Antidepressants.	lecture	Textbook 1/ Ch.17 (p 540-569) & 18 (p 570-631)	
8	Antipsychotic and anxiolytic agents. Hallucinogens. Antiparkinsonian and spasmolytic agents.	lecture	Textbook 1/ Ch.14 (p 448-484), 19 (p 632-657) & 13 (p 419-447)	
9	**Drugs Affecting the Cardiovascular System** Cardiac glycosides. Antianginal. Antiarrhythmic drugs. **Midterm Exam**	lecture	Textbook 1/ Ch.21 (p 700-727)	
10	Central sympatholytics and vasodilators. Central sympatholytics and vasodilators. Peripheral sympatholytics and vasodilators.	lecture	Textbook 1/ Ch.24 (p 781-814)	
11	Diuretics. Diuretics. Diuretics.	lecture	Textbook 1/ Ch.22 (p 728-746)	
12	Angiotensin converting enzyme inhibitors. Angiotensin converting enzyme inhibitors. Angiotensin antagonists.	lecture	Textbook 1/ Ch.23 (p 747-780)	
13	Calcium channel blockers. Antihyperlipoproteinemics. Inhibitors of cholesterol biosynthesis.	lecture	Textbook 1/ Ch.25 (p 815-840)	
14	Antithrombotics. Thrombolytics. Coagulants.	lecture	Textbook 1/ Ch.26 (p 841-876)	
15	Antihistamines and Related Antiallergic and Antiulcer Agents	lecture	Textbook 1/ Ch.32 (p 1062-1072)	
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
1	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video
2	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video
3	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video
4	Assignment (1)	Assignment on the E-Learning platform	Assignment marked out of 5
5	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video
6	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video
7	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video
8	Assignment (2)	Assignment on the E-Learning platform	Assignment marked out of 5
9	**Midterm Exam**	-	-
10	Watch a recorded lecture	Video on the E-learning platform	Answer questions embedded in the video
11	Group presentations	-	Presentations marked out of 5
12	Group presentations	-	Presentations marked out of 5
13	Group presentations	-	Presentations marked out of 5
14	Group presentations	-	Presentations marked out of 5
15	Group presentations	-	Presentations marked out of 5
16	**Final Exam**		