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.	**0201382**		**Course Name**		**Pharmacology Lab**	
Credit Hours	**1**		**Prerequisite *Co-requisite**		**Pharmacology (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		☑ **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**
				Blended Learning	**1 Traditional**

Brief Description

This course provides hands-on training in the handling of various laboratory animals and the practical observation of pharmacological effects of drugs in both *in vivo* and *in vitro* settings. Students will conduct experiments, using rabbits and/or mice, involving general anesthetics, analgesics, insulin, ocular drugs, nonsteroidal anti-inflammatory drugs (NSAIDs), and drugs that act on the rabbit intestine.

Learning Resources

Course Book Information (Title, author, date of issue, publisher ... etc)	Manual of practical pharmacology			
Supportive Learning Resources (Books, databases, periodicals, software, applications, others)	1. Manual of practical pharmacology I and II 2. Lippincott Illustrated Reviews – Pharmacology; K. Whalen, C. Field, and R. Radhakrishnan; 7th Edition; 2019; Wolters Kluwer			
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	Recognize the type of animals used in pharmacological experiments.	**MK3**
K2	Identify the drugs response, either therapeutic or toxic, using *in vitro* and *in vivo* experiments.	**MK3**
K3	Outline various experiments that are used to induce different animal models for studying the drug's response.	**MK3**
K4	Distinguish the major equipment and tools used in the assessment of drug's response.	**MK3**
Skills		
The student should be able to:		
S1	Handle the laboratory animals.	**MS2**
S2	Design pharmacological experiments using *in vitro* and *in vivo* methods.	**MS2**
S3	Analyze the data regarding the drug's response.	**MS2**
Competencies		
The student should be able to:		
C1	Design experimental model investigating the pharmacological effect of drugs covered in this course.	**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%	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	Experiment	Learning Style*	Reference ** (Pages in Course Book)
1	Introduction and instructions	Lecture	**6**
2	Handling of laboratory animals and routes of drug administration	Lecture and experiment	**7-9**
3	Insulin induced hypoglycemic shock	Lecture and experiment	**10-14**
4	Effects of autonomic drugs on rabbit eyes	Lecture and experiment	**15-18**
5	General anesthesia	Lecture and experiment	**19-21**
6	Tissue bath and preparation of rabbit intestine for testing of drugs	Lecture	**23-24**
7	Dose- response curve	Lecture and experiment	**26-27**
8	Effect of agonist and antagonist on rabbit duodenum	Lecture and experiment	**22-25**
9	Drug antagonism		**22-25**
10	Biological assay of agonist	Lecture and experiment	**38-40*** **
11	Testing analgesics	Lecture and experiment	**28-32**
12	Toxic effect of non-steroidal anti-inflammatory drugs (diclofenac), and drugs antagonize their effect (H2 blockers) on rabbit intestine	Lecture and experiment	**33-36**
13	The response of skin to histamine and adrenaline	Lecture and experiment	**37-38**
14	Effects of drugs on isolated rabbit heart settings	Lecture and experiment	**57-62*** **
15	Effects of drugs on isolated rabbit heart experiment	Lecture and experiment	**57-62*** **
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.*
**** supporting reference number 1.*

Schedule of Asynchronous Interactive Activities *(in the case of e-learning and blended learning)*

Week	Task / Activity	Reference	Expected Results
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