

Course Plan for Bachelor Program - Study Plan Development and Updating Procedures/ Pharmacy Department	QF02/0408-4.0E
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Study Plan No.	2021/2022	University Specialization	Bachelor of Pharmacy
Course No.	0201457	Course Name	Selected Topics in Pharmaceutical Microbiology
Credit Hours	3	Prerequisite *Co-requisite	Pharmaceutical Microbiology
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	1. Traditional Learning
Teaching Model	☐ 2 Synchronous: 1 Asynchronous	☒ 1 Face to Face: 1 Asynchronous	2. 3 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
				Blended Learning
				Approved Model
				1 Face to Face: 1 Synchronous

Brief Description

This course covers the principles of microbial pathogenicity and epidemiology, the details of mechanisms of resistance to antimicrobials and microbial biofilm and how to control them. Students will also learn the use of microorganisms in pharmaceutical industry for the production of antibiotics, vaccines and immunological products. The student will gain knowledge and skills about scientific research methods and be able to use electronic resources to stay updated in current topics and newly emerging aspects of pharmaceutical microbiology.

Learning Resources

Course Book Information (Title, author, date of issue, publisher ... etc)	1. Hugo and Russell's pharmaceutical microbiology. Gilmore, B. F., & Denyer, S. P. (Eds.). John Wiley & Sons. UK; 9 th Edition, 2023. 2. Antibiotic resistance: mechanisms and new antimicrobial approaches. Kon, K., & Rai, M. Academic press Elsevier Inc, 2016.			
Supportive Learning Resources (Books, databases, periodicals, software, applications, others)	1. Burton's Microbiology for the health sciences. Engelkirk, Paul G & Duben-Engelkirk, Janet L, (author.) & Burton, Gwendolyn R. W. (Gwendolyn R. Wilson). Wolters Kluwer Health, Philadelphia; 9 th Edition, 2015.			
Supporting Websites	Related publications			
The Physical Environment for Teaching	☒ Classroom	☐ Labs	☒ Virtual Educational Platform	☐ Others

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Necessary Equipment and Software	☒ Moodle. ☒ Microsoft office
Supporting People with Special Needs	
For Technical Support	E-Learning & Open Educational Resources Center Email: elarning@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 principles of microbial pathogenesis and some diseases affecting humans.	MK3
K2	Identify bacterial resistance against antimicrobial drugs.	MK3
K3	Predict susceptible infecting microorganisms and first line antimicrobial therapy to a particular agent.	MK3
K4	Recognize the methods of preparing vaccines and different immunological products and their quality control assays.	MK3
Skills		
The student should be able to:		
S1	Design policies to limit drug resistance in hospitals and communities.	MS3
S2	Select the first line antimicrobial therapy for different infectious diseases.	MS3
S3	Summarize the basic principles of manufacture and quality control of immunological products.	MS4
Competencies		
The student should be able to:		
C1	Recognize application of proper use of antimicrobial agents and control of contamination.	MC1
C2	Communicate effectively with infection control committees in hospitals for setting antibiotic policies.	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: Asynchronous interactive activities are activities, tasks, projects, assignments, research, studies, projects, 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.

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Schedule of Simultaneous / Face-to-Face Encounters and their Topics

Week	Subject	Learning Style*	Reference **
1	Principles of microbial pathogenicity and epidemiology.	Lecture	Hugo and Russell's (123-134)
2	Principles of microbial pathogenicity and epidemiology.	Lecture	Hugo and Russell's (123-134)
3	Microbial biofilms: Consequences for health.	Lecture	Hugo and Russell's (135-146)
4	Bacterial resistance to antibiotics: mechanisms of resistance.	lecture	Hugo and Russell's (249-266)
5	Bacterial resistance to antibiotics: multiple drug resistance	Lecture	Hugo and Russell's (267-269)
6	Trends in antimicrobial resistance among enteric pathogens: Key problems of resistance in hospitals and communities.	Lecture	Antibiotic Resistance (63-69)
7	Trends in antimicrobial resistance among enteric pathogens: How can we manage and prevent drug resistance?	Lecture	Antibiotic Resistance (69-89)
8	Clinical uses of antimicrobial drugs: Principles of use of antimicrobial drugs.	lecture	Hugo and Russell's (273-278)
9	Clinical uses of antimicrobial drugs: Antibiotic policies. Midterm Exam	lecture	Hugo and Russell's (286-287)
10	Laboratory evaluation of antimicrobial agents	lecture	Hugo and Russell's (365-384)
11	The manufacture and quality control of immunological products	lecture	Hugo and Russell's (462-434)
12	The wider contribution of microbiology to the pharmaceutical sciences.	lecture	Hugo and Russell's (509-528)
13	Alternative strategies for antibiotics: priorities for development		Hugo and Russell's (529-542)
14	Seminars		Selected related topics
15	Seminars		Selected related topics
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	Interactive recorded video	Video on E-learning platform	Answer questions embedded in the video
2	Interactive recorded video	Video on E-learning platform	Answer questions embedded in the video
3	Assignment related to the topic	Different resources	Assignment will be marked
4	Case study /Forum	Websites	Discussion of the case will be marked
5	Quiz 1	Selected topics	Quiz will be marked out of 5

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6	Interactive recorded lecture	Video on E-learning platform	Answer questions embedded in the video
7	Interactive recorded lecture	Video on E-learning platform	Answer questions embedded in the video
8	Midterm Exam		
9	Interactive recorded lecture	Video on E-learning platform	Answer questions embedded in the video
10	Interactive recorded lecture	Video on E-learning platform	Answer questions embedded in the video
11	Quiz 2	Selected topics	Quiz will be marked out of 5
12	Case study/ Forum	Different resources	Discussion of the case will be marked
13	Assignment related to the topic	Website	Assignment will be marked
14	Recorded presentations	Latest publications	Research and writing skills
15	Recorded presentations	Latest publications	Research and writing skills
16	Final Exam		