Syllabus: Practical Pharmaceutical Microbiology (#131701341)
Second Semester 2024/2025

COURSE INFORMATION	
Course Name: Practical Pharmaceutical Microbiology **Learning method:** Blended learning **Semester:** Second **Department:** Pharmaceutics and Pharmaceutical Technology **Faculty:** Pharmaceutical Sciences	**Course Code:** 131701341 **Section:** As per semester **Core Curriculum**: 2019 Study Plan **JNQF Level:** 7
Day(s) and Time(s): According to HU courses timetable/semester **Classroom:** As per semester **Date prepared:** February 2022 **Date updated:** November 2024	**Credit Hours:** 1 **Prerequisites**: 131701334 م

COURSE DESCRIPTION

In this course the students will apply some of the knowledge they gained in pharmaceutical microbiology & Sterilization and sterile manufacturing. The students will prepare growth media, perform tests used to monitor the environment (air, personnel, water, etc). Also the students will perform microbial identification through gram staining. The students will perform and evaluate different Sterilization techniques. The students will perform various in vitro tests for evaluating antimicrobial agents & will perform some microbial quality tests for sterile and non-sterile products.

DELIVERY METHODS

The course will be delivered through a combination of active learning strategies. These will include:

- PowerPoint lectures and active classroom-based discussion
- Students divided in groups acting in practical lab work
- Relevant films and documentaries
- Video lectures
- E-learning resources: e-reading assignments and practice quizzes through Model and Microsoft Team

- Student have to prepare and study Record discussion on moodle & team before lab time.
- In lab , Brief discussion well held to summarize the topics and discuss the procedure of experiment in details
- Discuss and explain the experimental results with each group.

FACULTY INFORMATION

Name	**MSc. Mai Jaber**
Academic Title:	**Assistant lecturer**
Office Location:	**Third Floor**
Telephone Number:	**Extension: 3426**
Email Address:	**m.jaber@hu.edu.jo**
Office Hours:	**As announced per semester** ***Please send an e-mail (enaam@hu.edu.jo) to meet at any other time.***

REFERENCES AND LEARNING RESOURCES

Required Textbook(s):.

Pharmaceutical Microbiology Laboratory Manual

Useful Web Resources:

As per each lecture.

COURSE OBJECTIVES

By the end of this practical the student will develop the following skills

1. Explain and correctly demonstrate use of the scientific method
2. Transfer living microbes using aseptic technique.
3. Demonstrate proficiency and use of the following in the laboratory: streak plate isolation technique; bacterial staining techniques; wet mounts; and proper culture handling.
4. Visually recognize and explain the macroscopic and microscopic characteristics of fungi, protozoa, and bacteria.
5. Understand and explain environmental factors that influence microbes.
6. Properly obtain, culture, identify, and explain microorganisms in environmental cultures.
7. Measure the efficacy and potency of different antimicrobial agents
8. use different sterilization methods and designing optimum sterilization cycles
9. Monitor microbiological quality for both sterile and non-sterile dosage forms

COURSE INTENDED LEARNING OUTCOMES (CILOs)

A. Foundational Knowledge

A.1 Understand laboratory safety awareness, the structure and classification of bacteria, and the methods used to monitor microbial quality and contamination.

A.2 Analyze the mechanism of infection, bacterial susceptibility, resistance, and the effectiveness of different antimicrobial agents.

A.3 Evaluate microbial susceptibility and sterilization techniques to control contamination and ensure quality.

B. Essentials for Practice and Care

B.1 Calculate and interpret the minimum inhibitory concentration (MIC) of antimicrobial agents, and judge the microbial quality of pharmaceutical preparations and environmental conditions.

B.2 Identify microorganisms macroscopically, microscopically, and through different culture methods and media.

C. Approach to Practice and Care

C.1 Apply practical skills in aseptic techniques, microbial culture handling, and performing susceptibility tests.

D. Personal and Professional Development

D.1 Demonstrate teamwork, leadership, and time management in group activities.

D.2 Communicate effectively in both written and oral formats with peers and tutors.

D.3 Show responsibility, integrity, and professionalism by adhering to regulations and avoiding unethical practices.

ACADEMIC SUPPORT

It is The Hashemite University policy to provide educational opportunities that ensure fair, appropriate and reasonable accommodation to students who have disabilities that may affect their ability to participate in course activities or meet course requirements. Students with disabilities are encouraged to contact their instructor to ensure that their individual needs are met. The University through its Special Need section will exert all efforts to accommodate for individual's needs.

Special Needs Section:

Tel: **00962-5-3903333 Extension: 4209**
Location: **Students Affairs Deanship/ Department of Student Welfare Services**
Email: **amalomoush@hu.edu.jo**
amalomoush@staff.hu.edu.jo

COURSE REGULATIONS

Participation

Excellent attendance is expected. According to the university policy, students who miss more than 15% of the lecture hours with or without excuse will be dismissed from the course. It is a student's responsibility to monitor the frequency of their own absences. **Attendance record begins on the first day of class irrespective of the period allotted to drop/add and late registration. It is a student's responsibility to sign-in; failure to do so will result in a non-attendance being recorded.**

In exceptional cases, the student, with the instructor's prior permission, could be exempted from attending a lecture provided that the number of such occasions does not exceed the limit allowed by the University. The instructor will determine the acceptability of an absence for being absent. A student who misses more than 25% of classes and has a valid excuse for being absent will be allowed to withdraw from the course.

On average, students need to spend 3 hrs of study and preparation weekly. At the beginning of the lectures, students should be on time and should not leave before the end of the lecture without an

accepted excuse. **If the student missed a class, it is him/her responsibility to find out about any announcements or assignments they have missed.** For any clarification, students should communicate with their instructor at her posted office hours or by appointment. Students should listen well to the lecture, if anyone has a question, he/she should ask the instructor. Students can find the course material at the course Microsoft team/Model after the lecture.

Switch off your mobile or keep it silent throughout the lecture. Listen well to the lecture and avoid side discussions.

Sharing of course materials is forbidden. No course material including, but not limited to, course outline, lecture hand-outs, videos, exams, and assignments may be shared online or with anyone outside the class. Any suspected unauthorized sharing of materials, will be reported to the university's Legal Affairs Office. If a student violates this restriction, it could lead to student misconduct procedures.

Plagiarism

Plagiarism is considered a serious academic offence and can result in your work losing marks or being failed. HU expects its students to adopt and abide by the highest standards of conduct in their interaction with their professors, peers, and the wider University community. As such, a student is expected not to engage in behaviours that compromise his/her own integrity as well as that of The Hashemite University.

Plagiarism includes the following examples, and it applies to all student assignments or submitted work:

- **Use of the work, ideas, images or words of someone else without his/her permission or reference to them.**
- **Use of someone else's wording, name, phrase, sentence, paragraph or essay without using quotation marks.**
- **Misrepresentation of the sources that were used.**

The instructor has the right to fail the coursework or deduct marks where plagiarism is detected

Missed lab session

In case of expected and valid excuse and if space is available you will be expected to attend another lab session to complete assigned work (you must contact your instructor to arrange this within 24 hours of the missed session). If this is not possible, and you are given an excused absence, you will be expected to make up the work at an assigned time. For any clarification, please communicate your instructor at his posted office hours or by appointment.

If your excuse is not valid you will take zero evaluation in your missed lab (all related lab session work).

Missed Assessments

Assignments are due at the beginning of the class period on the date/time designated by the instructor.

Late course work is not accepted (e.g. projects, reports, papers…), unless otherwise indicated by the instructor. Work will only be accepted in an emergency situation.

In all cases of assessment, students who fails to attend an exam on the scheduled date without prior permission, and/or are unable to provide a medical note, will automatically receive a failure grade for this part of the assessment.

In cases where a student misses an assessment on account of a medical reason or with prior permission; in line with university regulations an incomplete grade for the specific assessment will be awarded and an alternative assessment or extension can be arranged.

Cheating

Cheating, academic disconduct, fabrication and plagiarism will not be tolerated, and the university policy will be applied. Cheating policy: The participation, the commitment of cheating will lead to applying all following penalties together:

- Failing the subject, he/she cheated at
- Failing the other subjects taken in the same course
- Not allowed to register for the next semester
- The summer semester is not considered as a semester

Student Complaints Policy

Students at The Hashemite University have the right to pursue complaints related to faculty, staff, and other students. The nature of the complaints may be either academic or non-academic. For more information about the policy and processes related to this policy, you may refer to the students' handbook.

COURSE ASSESSMENT

Course Calendar and Assessment

Students will be graded through the following means of assessment:

Course Assessment Plan

Assessment	Grade Weighting	Deadline Assessment	CILOs			
			A	B	C	D
Quizzes	15%	During the semester	A	B	C	D
Reports	15%	Weekly	A	B	C	D
Lab Evaluation (lab performance, readiness, etc)	10%	weekly	A	B	C	D
Mid Exam (theoretical)	20%	To be announced	A	B	C	D
Final Exam	40%	The 14th	A	B	C	D

(Theoretical)		week				

Description of Quizzes:
Quizzes will be given during the semester based upon the previous lectures. As describe below:

Quiz 1 - week 3 (12-15/3): Experiment 2
Quiz 2 - week 4 (19-22/3): Experiment 3
Quiz 3 - week 8 (٤/٣٠-٣/٥): Experiment 7
Quiz 4 – week 12: ONLINE Experiment 10

Description of Reports:
Student reports that allow compiling, reviewing, and evaluating student work over time can provide a richer, deeper, and more accurate picture of what students have learned and are able to do than more traditional measures—such as standardized tests, quizzes, or final exams—that only measure what students know at a specific point in time.

Each reports should be submitted as a group report at the beginning of the next laboratory session. (Note: Experiment Report Workload Distribution Table should be filled for each reports)

Description of Lab Evaluation:
Each student is evaluated weekly based on the following points:

A. Attendance punctuality (2 mark)
B. Behavior and adherence to basic lab requirements (e.g. Appearance: Lab-Coat, hair) (1.5 mark)
C. Availability of Foil, Gloves, Markers, & Cleaning tools (2 mark)
D. Balance & Machines Use & Tools Use & their Cleaning (1 mark)
E. Team work (1 mark)
F. Procedure: Preparation & Adherence & Time frame (2.5 mark)

Description of Exams

Test questions will predominately come from material presented in the lectures and the lectures themselves. Semester exams may be conducted during the regularly scheduled lecture period. Exam may consist of a combination of multiple choice, short answer, match, true and false, and/or descriptive questions.

No make-up exams will be given. Only documented absences will be considered as per HU guidelines. Make-up exams may be different from regular exams in content and format.

Grades are not negotiable and are awarded according to the following criteria:

Letter Grade	Description	Grade Points
A+	Excellent	4.00
A		3.75

A-		3.50
B+	Very Good	3.25
B		3.00
B-		2.75
C+	Good	2.50
C		2.25
C-		2.00
D+	Pass	1.75
D	Pass	1.50
F	Fail	0.00
I	Incomplete	-

WEEKLY LECTURE SCHEDULE AND CONTENT DISTRIBUTION

All lectures are delivered by blended learning.

	Course Contents					
Date	**Week**	**Credit Hours**	**CILOs**	**Topics**	**Delivery Methods**	**Assessment methods**
	1	3	A	Orientation, course outline, lab safety, lab tools, microscopy. −Aseptic technique −Appropriate hygienic practices −Hand wash	Lecturing	Class participation Exam
	2	3	A B C D	− Preparation of culture media under aseptic conditions. − Sources of microbial contamination −Quality assurance – microbial monitoring of environment	Lecturing discussion Practical work	Class participation Laboratory Report Lab work evaluation Exam
	3	3	A B C D	Culturing Methods and Plating Techniques	Lecturing discussion Practical work	Class participation Laboratory Report Quiz Lab work evaluation Exam

	4	3	A B C D	Bacterial Identification Simple staining, Gram staining and differential medium	Lecturing discussion Practical work	Class participation Laboratory Report Quiz Lab work evaluation
	5	***Off week (First exam duration)***				
	6	3	A B C D	Sterilization Methods and Principles	Lecturing discussion Practical work	Class participation Laboratory Report Lab work evaluation Exam
	7	3	A B C D	Testing of disinfectants	Lecturing discussion Practical work	Class participation Laboratory Report Lab work evaluation Exam
	8	3	A B C D	Qualitative methods used for the evaluation of bacteriostatic activity of different antimicrobial agents	Lecturing discussion Practical work	Class participation Laboratory Report Lab work evaluation Exam
	9	***Eid al-Fitr Holidy***				
	10	3	A B C D	Determination of the minimal inhibitor concentration (MIC) of a bacteriostatic substance by agar diffusion and broth dilution method	Lecturing discussion Practical work	Class participation Laboratory Report Quiz Lab work evaluation Exam
	11	3	A B C D	Sterility testing of a pharmaceutical product	Lecturing discussion Practical work	Class participation Laboratory Report Lab work evaluation Exam
	12	3	A B C D	Data handling and interpretation associated with heat sterilization processes	Lecturing discussion Practical work	Class participation Laboratory Report Online quiz Lab work evaluation Exam
	14	- ***Theoretical final exam***				