Syllabus: General Microbiology (111501204)

First Semester 2025/2026

COURSE INFORMATION	
Course Name: General Microbiology **Semester:** First semester **Department:** Department of Microbiology, Pathology and Forensic Medicine. **Faculty:** Medicine	**Course Code: 111501204** **Section:** All sections **Core Curriculum**: MD
Day(s) and Time(s): **Theory**: Sunday: Group (A), 11:30 am –12:30 am Group (B), 12:30 pm – 1:30 pm Tuesday: Group (B), 9:00 am –10:30 am Group (A), 12:30 pm – 2:00 pm **Lab**: Thursday: Group (A), 12:30 pm – 2:00 pm Group (B), 2:00 pm – 3:30 pm **Classroom:** **Theoretical lectures:** Faculty of Medicine auditorium and Allied Medical Sciences auditorium. **Practical sessions:** lab of microbiology.	**Credit Hours:** 2.5 Theory 0.5 Lab **Prerequisites**: None

COURSE DESCRIPTION

This is a three-credit hour course (Theory and lab) mandatory for second-year medical students. This course intended to introduce undergraduate medical students to a variety of subjects in medical microbiology. The theoretical section of the course aims to give the basic and important biological characteristics of different groups of microbes (bacteria, viruses, fungi and parasites) in respect to their classifications, structure, growth requirements, virulence factors and pathogenesis. The course will also cover the most medically important diseases caused by these microbes and the different methods of diagnosis of these infections. The course gives information about the control of these microbes both in vivo and in vitro, through studying different antimicrobials, types, mechanism of action, uses and misuse, and how microbes develop resistance against them, in addition to various methods of sterilization and disinfection.

The laboratory sessions provide the second year dental student with the practical skills in medical microbiology in the form of lab safety, staining and culturing techniques and methods of isolation and identification of microbes and their antimicrobial susceptibility.

DELIVERY METHODS

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

- PowerPoint lectures and active classroom based discussion
- Relevant films and documentaries
- Video lectures
- E-learning resources: e-reading assignments and practice quizzes through Microsoft Team

Course Coordinator

Name	**Hala Tabl**
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	Sunday: 11-1
	Tuesday: 11-1

REFERENCES AND LEARNING RESOURCES

Required Textbook:

Kenneth J. Ryan, C. George Ray: Sherris Medical Microbiology, McGraw Hill Professional, 2018, Latest Edition.

Other tesxtbooks:

Collins and Lyne: Microbiological methods, Latest Edition

Jawetz, Melnick, & Adelberg's: Medical Microbiology, Latest Edition .

Bailey & Scott's: Diagnostic Microbiology, Latest Edition.

Useful Web Resources:

Nature Reviews Microbiology, Nature Publishing Group, ISSN 17401526, https://www.nature.com/nrmicro/

Cell Host and Microbe, Cell Press, ISSN 19313128, https://www.cell.com/cell-host-microbe/home

Microbiome, BioMed Central, ISSN 20492618, https://microbiomejournal.biomedcentral.com/

STUDENT LEARNING OUTCOMES MATRIX*

Program Learning Outcomes	Course Objectives	Course Student Learning Outcomes	Assessment Method
	1- Bacteriology: Understand the basic microbiological characteristics of bacteria and the medically important diseases caused by them.	**Introduction to Microbiology** -Outline historical Background of microbiology. -Recognize different types of microbes and differentiate between eukaryotes and prokaryotes. **Bacterial Cell Structure** -Describe different parts of bacterial cell. -Understand function and importance of each bacterial structure.	• Exams
		Bacterial genetics -Identify different genetic material in bacterial cell. -Recognize bacterial plasmid, its types and functions. -Understand phenotypic and genotypic variations in bacteria and different methods of gene transfer and its clinical applications. **Bacterial Growth and metabolism** -Define bacterial growth & method of reproduction. -Understand different stages of bacterial growth curve. -Classify bacteria according to their growth requirements.	• Exams
		Diagnosis of microbial growth -Recognize the role of direct microscopic examination, bacterial cultivation in microbial identification. -Understand the principle and applications of different biochemical and molecular techniques used in microbiology. **Serological tests** -Understand the principle and applications of different serological tests used in microbiology.	• Exams
		Antimicrobials & Drug Resistance -Identify different classes of antimicrobials. -Recognize the different mechanisms of action of antibiotics. -Recognize complications of antibiotic. -Understand different mechanisms of antibiotics resistance. **Sterilization and Disinfection** -Define and differentiate between sterilization & disinfection. -List different methods of sterilization and disinfection and understand their applications in control of microorganisms.	• Exams
		Gram positive cocci -Understand the main microbiological characteristics, virulence factors and the diseases caused by the medically important Gram positive cocci group of bacteria.	• Exam
		Gram negative cocci -Understand the main microbiological characteristics, virulence factors and the diseases caused by the medically important Gram negative cocci group of bacteria.	• Exams
		Gram positive bacilli -Understand the main microbiological characteristics, virulence factors and the diseases caused by the medically important Gram positive bacilli group of bacteria.	• Exams
		Gram negative bacilli (Enterobacteriace) -Understand the main microbiological characteristics, virulence factors and the diseases caused by the medically important Gram negative bacilli group of bacteria.	• Exams

		Haemophilus, Bordetella, and Pseudomonads -Understand the main microbiological characteristics, virulence factors and the diseases caused by Haemophilus, Bordetella, and Pseudomonads	
	2- Mycology: Understand the basic characteristics of fungi and important human mycosis.	**Introduction mycology** -Identify importance, structure, morphological forms and methods of reproduction of fungi. -Recognize medically important types of human mycoses & mycotoxines.	• Exams
	3- Parasitology: Understand the basic characteristics of parasites and important diseases caused by them.	**Introduction to Parasitology & Protozoa** -Understand the basic characteristics and classifications of parasites. -Understand the general morphology, life cycle and diseases caused by the medically important protozoa. **Helminths** -Understand the general morphology, life cycle and diseases caused by the medically important helminths.	• Exams
	4- Virology: Understand the basic characteristics of viruses and important diseases caused by them.	**Introduction to Virology & Viral structure** -Identify general properties of viruses -Describe Structure & Genetics of viruses. -Recognize nomenclature and classifications of viruses.	• Exams
		Viral Replication and pathogenesis -Understand steps of viral replication -Understand steps and factors affecting viral pathogenesis -Understand immune response against viral infection	• Exams
		Diagnosis and control of Viral Infections -Understand different methods of diagnosis of viral infections. -Recognize methods to control and inactivate viruses. -Outline different classes and mode of action of anti-viral drugs. -Understand principles, types and applications of anti-viral vaccines.	• Exams
		DNA Viruses & RNA Viruses -Recognize most medically important viral families and disease caused by them.	• Exams
	5- Practical Microbiology: Become proficient in laboratory skills and safety protocols, and able to interpret results of different laboratory methods used in diagnosis of bacterial infections.	**Laboratory tools and safety** -Aware of different instruments & equipment in microbiology lab -Apply different laboratory skills and safety protocols. **Bacterial Staining** -Differentiate between different types of bacterial stain. -Identify principles of Gram stain and apply the technique and interpret its result under microscope. **Bacterial culture & Colony morphology** -Understand principle and importance of bacterial culture. -List different types and classifications of Culture media. -Identify and differentiate between different bacteria according to their colony morphology. **Biochemical tests** -Understand principles, types, applications of different biochemical tests and interpret their results. **Serological Diagnosis** -Understand different serological tests and their clinical applications. --Apply, read and interpret results of different serological tests.	• Exams

		Antibiotic Susceptibility -Understand principles of different antibiotic susceptibility tests and their applications -Apply, read and interpret reports of antibiotic susceptibility tests and how to measure MIC & MBC.	

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: Deanship of student's affairs

COURSE REGULATIONS

General rules:

- **Missed exams:** Students who are absent in any exam are allowed to sit a make-up exam after presenting an approved sick leave or any accepted certificate of absence to the assistant of the faculty dean within 72 hours. The Course Coordinator will determine the time of the exam make-up session. Also, according to the Curriculum Committee and the University regulations, the student will sit an essay examination. All examinations must be made up within one week of returning to class. Those absents who do not present a clue will be given a zero mark.
- **Absence:** Professionalism is a major component of our medical curriculum. We believe students should conduct themselves appropriately in the various educational activities of the curriculum. This conduct includes coming to educational activities on-time. The faculty should also demonstrate professionalism, by starting and ending all scheduled educational activities on time and providing a course schedule with clearly explained course policies in the course syllabus. Any changes in the schedule should be given to the students in a timely manner.
- Students will be accountable and personally responsible for attending all educational activities (lectures, labs, examinations, etc.). Unexcused absences reflect negatively on the goals and objectives of the medical curriculum and demonstrate unprofessional behavior by the respective student.
- Students are expected to attend all scheduled activities. Students are expected to be on time. Being on time is defined as being ready to start at the assigned time. If a student has an emergency that prevents her/him from attending a scheduled activity, s/he has to notify the Course Coordinator and present an approved sick leave or any accepted certificate of absence by the faculty dean assistant.
- Attendance is mandatory. Students are expected to attend all scheduled activities. Students are expected to be on time. Being on time is defined as being ready to start at the assigned time. If a student has an emergency that prevents her/him from attending a scheduled activity, s/he has to notify the Course Coordinator and present an approved sick leave or any accepted certificate of absence by the faculty dean assistant. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.
- **Cheating:** Cheating will not be tolerated. Each individual student is responsible for his behavior and is expected to maintain standards of academic honesty and professionalism. If any instance of academic dishonesty (cheating, plagiarism, etc.) is discovered by a coordinator or an instructor, it is

his or her responsibility to take appropriate action. Such action may include giving a failing grade to the student in the course and/or referring the student for Judicial Procedures Office review and possible disciplinary action, which may include disciplinary suspension or dismissal from the College.

Classroom Protocol:

- Professionalism is a major component of our medical curriculum. We believe students should conduct themselves appropriately in the various educational activities of the curriculum. This conduct includes coming to educational activities on-time. The faculty should also demonstrate professionalism, by starting and ending all scheduled educational activities on time and providing a course schedule with clearly explained course policies in the course syllabus. Any changes in the schedule should be given to the students in a timely manner.
- Students respond politely to faculty, staff, and student colleagues, exemplifying their maturity and empathy. Students agree to abide by appropriate biosafety practices when required.
- All students are expected to be quiet in their seats in the lecture theatre before the start of the lecture. Engagement in class discussions is encouraged without side chatting.

  Cell phones are not allowed to be used during lectures and exams unless prior approval has been taken from the course instructor.

Laboratory Safety

- Lab coats and safety glasses must be worn at all times while in the laboratory. Regular prescription glasses are generally not made with safety glass and thus safety glasses must be worn over the top of these glasses at all times. Safety glass checks will be made throughout the semester.
- Only the materials pertinent to lab work, such as a lab manual/notebook, and other lab materials, should be brought to your workspace. All other items such as coats, books, and bags should be stored on the shelves provided for this purpose.
- No eating, drinking or smoking in the lab.
- Know lab safety procedures and the location of the first aid kit, eyewash, and fire extinguisher.
- All culture material should be handled as if it were potentially harmful.
- Be very careful with Bunsen burners. Avoid wearing loose clothing that may be exposed beneath a lab coat and thus provide potential fuel for the flame. Burners should be turned off when not in use.
- Long hair must be tied back at all times while in the laboratory. Long pants and closed toed shoes are suggested.
- The chemical compounds used to stain bacteria can be irritating to the skin. The use of gloves when performing staining procedures will help minimize exposure.
- Dispose of materials as instructed. Do not carelessly throw materials in wastebaskets or sinks; biohazard waste containers are available.
- Report any accident or injury immediately to the laboratory instructor so that prompt action can be taken.
- After each lab, WASH your hands before leaving the laboratory.
- The surfaces of lab benches are washed with disinfectant and rinsed with water twice a day by the teaching assistants and instructor.
- If you have any allergies, chemical sensitivities or if you are pregnant or think you may become pregnant, please identify yourself to the instructor. If, for any of these reasons (or others), you believe that your safety is compromised in the lab, we will make alternative arrangements for completion of this portion of the course.

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 and their final grade will be calculated from the forms of assessment as listed below with their grade weighting taken into account. The criteria for grading are listed at the end of the syllabus

Assessment	Form	Grade Weighting	Deadline Assessment
Exam 1 (mid)	MCQs	40%	30/11/2025
Exam 2 (Practical)	MCQs	20%	1/6/2026
Exam 3 (Final)	MCQs	40%	18/1/2026

Description of Exams

Test questions will predominately come from material presented in the lectures. Semester exams will be conducted during the regularly scheduled lecture period. Exam will consist of multiple choice.

No make-up exams, homework or quizzes will be given. Only documented absences will be considered as per HU guidelines.

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

Theoretical Lectures

Week number	Day	Date	Lecture topic	Lecturer
1	Sunday Tuesday	5/10 7/10	Introduction for Microbiology Bacterial Cell Structure	Dr. Hala Dr. Hala
2	Sunday Tuesday	12/10 14/10	Bacterial Growth and Nutrition Bacterial genetics	Dr. Hala Dr. Hala
3	Sunday Tuesday	19/10 21/10	Diagnosis of microbial growth Serological diagnosis	Dr. Hala Dr. Hala
4	Sunday Tuesday	26/10 28/10	Antimicrobial resistance (AMR) Control and Sterilization of Microorganisms	Dr. Hala Dr. Hala
5	Sunday Tuesday	2/11 4/11	Introduction to Parasitology Protozoa & Helminthes	Dr. Hala Dr. Hala
6	Sunday Tuesday	9/11 11/11	General Mycology Gram-Positive Bacilli	Dr. Hafez Dr. Hafez
7	Sunday Tuesday	16/11 18/11	Gram-Negative Rods (Enterobacteriace) Haemophilus, Bordetella, and Pseudomonads	Dr. Hafez Dr. Hafez
8	Sunday Tuesday	23/11 25/11	Gram-Positive Cocci Gram-Negative Cocci	Dr. Mohammad Dr. Mohammad
9	Sunday Tuesday	30/11 2/12	Introduction to Virology Viral Structure	Dr. Mohammad Dr. Mohammad
10	Sunday Tuesday	7/12 9/12	Viral Replication Viral Pathogenesis	Dr. Mohammad Dr. Mohammad
11	Sunday Tuesday	14/12 16/12	Viral Immunology Viral Genetics	Dr. Mohammad Dr. Mohammad
12	Sunday Tuesday	21/12 23/12	Diagnosis of Viral Infections Anti-Viral agents	Dr. Mohammad Dr. Mohammad
13	Sunday Tuesday	28/12 30/12	DNA Viruses RNA viruses	Dr. Mohammad Dr. Mohammad
14	Sunday Tuesday	4/1 6/1	Revision Revision	
15 16	——— ———	——— ———	**Final Exam period**	

Practical Laboratory sessions:

Lab	Topic	Day	Date	group	Instructor
1.	Introduction and safety	Thursday	16/10	A, B	Dr. Hafez
2.	Gram stain	Thursday	23/10	A, B	Dr. Hafez
3.	Serological tests	Thursday	6/11	A, B	Dr. Hala
4.	Antibiotic Susceptibility	Thursday	13/11	A, B	Dr. Hala
5.	Culture media & Colony morphology	Thursday	11/12	A, B	Dr. Mohammad
6.	Biochemical tests	Thursday	18/12	A, B	Dr. Mohammad