Syllabus: General Microbiology (111501204)

First Semester 2023/2024

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, Tuesday and Thursday: 9:00 am–1:00 pm **Lab**: Sunday, Tuesday and Thursday: 1:00 pm – 3:00 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 course is an introductory course intended to introduce undergraduate medical students to a variety of subjects in medical microbiology. The course will provide an introduction to the basic principles and application relevance of clinical disease for students who are in preparation for physicians. The content of this rigorous course covers all biology of bacteria, viruses, fungi, parasites, and other pathogens related with infectious diseases in humans.

The course provides the second year medical student with the basic knowledge as well as the practical skills in medical microbiology. In addition to the introduction to the basic biology of micro- organisms of medical importance, interaction of these micro-organisms with humans is studied as related to the pathogenesis and management and control of infectious diseases.

To achieve the maximum benefit of this course and to develop both informatic and diagnostic skills in microbiology including the practical application and interpretation of laboratory tests for the diagnosis of infectious diseases; hard work and appropriate methods of learning are the keys for that target.

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 Model and Microsoft Team

Course Coordinator

Name	**Hala Tabl**
Academic Title:	**Professor of Microbiology and Immunology**
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Office Hours:	**Sunday:** 11-12 **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. Introduction: Understand the concept of medical microbiology.	1.1 Introduction to Microbiology	• Exams
	2. Understand the bacterial cell structure, growth, nutrition and genetics	2.1 Bacterial Cell Structure 2.2 Bacterial Nutrition and Growth 2.3 Bacterial Genetics	• Exams
	3. Describe the various methods of sterilization and disinfection	3.1 Control of Microorganisms: Sterilization and Disinfection	• Exams
	4. Understand the various types of antimicrobial chemotherapy	4.1 Antimicrobial Drugs 4.2 Antimicrobial Resistance	• Exams
	5. Bacteriology: Differentiate between Gram positive and Gram negative bacteria as well as mycobacteria, rickettsia, chlamydia, mycoplasma and spirochaetes	5.1 Gram-Positive Cocci 5.2 Gram-Negative Cocci 5.3 Aerobic Gram-Positive Bacilli 5.4 Anaerobic Gram-Positive Bacilli 5.5 Haemophilus, Bordetella and Moraxella 5.6 Enterobacteriacae 5.7 Pseudomonads, Acinetobacter and other Gram-Neg. Bacilli 5.8 Vibrios, Campylobacter and Helicobacter 5.9 Brucella and Yersinia 5.10 Mycobacteria 5.11 Rickettsia, Chlamydia and Mycoplasma 5.12 Spirochaetes, Bacteroides and non-sporing Anaerobes	• Exams
	6. Mycology: Understand the importance, morphological forms and reproduction of fungi Understand the difference between major superficial, subcutaneous and systemic fungi.	6.1 Introduction to Mycology 6.2 Superficial & subcutaneous mycosis 6.3 Systemic mycosis	• Exams
	7. Parasitology: Understand the basic characteristics and classifications of parasites. Understand the general morphology life cycle and clinical importance of different protozoa and helminths	7.1 Introduction to Parasitology 7.2 Protozoa 7.3 Helminths	• Exams
	8. Virology: Understand the viral structure, replication, and genetics Understand the pathogenesis and immunity to viral infections Describe the various diagnostic	8.1 Introduction to Virology 8.2 Viral Structure and Replication 8.3 Viral Genetics	• Exams

	methods of viral infections Understand the concept anti-viral chemotherapy Differentiate between DNA and RNA viruses	8.4 Pathogenesis and Immunity to 8.5 Viral Infections 8.6 Diagnosis of Viral Infections 8.7 Anti-Viral Agents 8.8 DNA Viruses 8.9 RNA Viruses	
	9. Practical Microbiology: • Become proficient in laboratory skills and safety protocols . • Learn to follow experimental procedures. • Apply the scientific method: formulate answerable questions/hypotheses, predict expected results, make careful observations, collect and analyze/interpret data, and draw appropriate conclusions . • To show proficiency in scientific writing (laboratory reports) • Embark in active learning opportunities in the laboratory . • Demonstrate good lab student and the ability to work with others	9.1 Laboratory orientation, instruments & equipment. 9.2 Laboratory Safety 9.3 Cultivation and isolation of bacteria 9.4 Culture media and colonial morphology 9.5 Gram stain and Ziehl-Neelsen stain 9.6 Biochemical tests 9.7 Parasitology Lab 9.8 Antibiotic susceptibility tests 9.9 Diagnostic tools in Microbiology	• Exams

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.
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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	Grade Weighting	Deadline Assessment
Exam 1 (mid)	40%	2/12/2023
Exam 2 (Practical)	20%	4/1/2023
Exam 3 (Final)	40%	21/1/2023

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	8/10	Introduction and History of Microbiology	Dr. Mohammad
	Tuesday	10/10	Bacterial Cell Structure	Dr. Mohammad
	Thursday	12/10	Bacterial Growth and Nutrition 1	Dr. Mohammad
2	Sunday	15/10	Bacterial Growth and Nutrition 2	Dr. Mohammad
	Tuesday	17/10	Bacterial genetics	Dr. Mohammad
	Thursday	19/10	Control and Sterilization of Microorganisms	Dr. Mohammad
3	Sunday	22/10	Diagnosis of microbial growth 1	Dr. Mohammad
	Tuesday	24/10	Diagnosis of microbial growth 2	Dr. Mohammad
	Thursday	26/10	Gram-Positive Cocci 1	Dr. Mohammad
4	Sunday	29/10	Gram-Positive Cocci 2	Dr. Mohammad
	Tuesday	31/10	Gram-Negative Cocci	Dr. Mohammad
	Thursday	2/11	Haemophilus, Bordetella, and Pseudomonads	Dr. Mohammad
5	Sunday	5/11	Antimicrobial resistance (AMR)	Dr. Mohammad
	Tuesday	7/11	Gram-Negative Rods (Enterobacteriace) 1	Dr. Hafez
	Thursday	9/11	Gram-Negative Rods (Enterobacteriace) 2	Dr. Hafez
6	Sunday	12/11	Gram-Positive Bacilli	Dr. Hafez
	Tuesday	14/11	Introduction to Mycology	Dr. Hala
	Thursday	16/11	Important fungal infections	Dr. Hala
7	Sunday	19/11	Introduction to Parasitology	Dr. Hala
	Tuesday	21/11	Protozoa	Dr. Hala
	Thursday	23/11	Helminthes	Dr. Hala
8	Sunday	26/11		
	Tuesday	28/11	Introduction to Virology	Dr. Ashraf
	Thursday	30/11		
9	**Sunday**	**3/12**	**Midterm Exam**	
	Tuesday	5/12	Viral Structure	Dr. Ashraf
	Thursday	7/12		
10	Sunday	10/12	Viral Replication 1	Dr. Ashraf
	Tuesday	12/12	Viral Replication 2	Dr. Ashraf
	Thursday	14/12	Viral Pathogenesis 1	Dr. Ashraf
11	Sunday	17/11	Viral Pathogenesis 2	Dr. Ashraf
	Tuesday	19/12	Viral Immunology	Dr. Ashraf
	Thursday	21/12	Viral Genetics	Dr. Ashraf
12	Sunday	24/12	Diagnosis of Viral Infections	Dr. Ashraf
	Tuesday	26/12	Anti-Viral agents 1	Dr. Ashraf
	Thursday	28/12	Anti-Viral agents 2	Dr. Ashraf

13	Sunday Tuesday Thursday	31/12 2/1 **4/1**	DNA Viruses _____ **Practical Exam**	Dr. Ashraf
14	Sunday Tuesday Thursday	7/1 9/1 11/1	RNA viruses Revision Revision	Dr. Ashraf
15	_____	_____	_____	
16	**Sunday**	**21/1**	**Final Exam**	

Practical Laboratory sessions:

Lab	Topic	Day	Date	Time	group	Instructor
1.	Introduction and safety	Sunday Tuesday Thursday	22/10 24/10 26/10	1 pm -3 pm 1 pm -3 pm 1 pm -3 pm	A B C	Dr. Hafez Dr. Hafez Dr. Hafez
2.	Culture	Sunday Tuesday Thursday	5/11 7/11 9/11	1 pm -3 pm 1 pm -3 pm 1 pm -3 pm	A B C	Dr. Hala Dr. Hala Dr. Hala
3.	Gram stain	Sunday Tuesday Thursday	12/11 14/11 16/11	1 pm -3 pm 1 pm -3 pm 1 pm -3 pm	A B C	Dr. Mohammad Dr. Mohammad Dr. Mohammad
4.	Colony morphology	Sunday Tuesday Thursday	19/11 21/11 23/11	1 pm -3 pm 1 pm -3 pm 1 pm -3 pm	A B C	Dr. Ashraf Dr. Ashraf Dr. Ashraf
5.	Biochemical tests	Sunday Tuesday Thursday	10/12 12/12 14/12	1 pm -3 pm 1 pm -3 pm 1 pm -3 pm	A B C	Dr. Mohammad Dr. Mohammad Dr. Mohammad
6.	Parasitology	Sunday Tuesday Thursday	17/12 19/12 21/12	1 pm -3 pm 1 pm -3 pm 1 pm -3 pm	A B C	Dr. Hala Dr. Hala Dr. Hala