



The Hashemite University
Course Syllabus
General Microbiology

1	Course title	General Microbiology
2	Course number	111501204
3	Credit hours (theory, practical)	3 (2.5 theory, 0.5 practical)
	Contact hours (theory, practical)	Theory: 2.5 hours per week Practical: 2 hours per week
4	Course meeting time	Variable
	Course location	Allied Health Stadium
5	Program title	Doctor of Medicine
7	Awarding institution	The Hashemite University
8	Faculty	Faculty of Medicine
9	Department	Basic medical sciences
10	Level of course	Second year medical students
11	Year of study and semester (s)	First semester 2018/2019
12	Final Qualification	MD degree
13	Other department (s) involved	None
14	Language of Instruction	English
15	Date of production/revision	09/2018

Course Coordinator:

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Other instructors:

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Dr. Mohammad Al Tamimi, MD, PhD
Dr. Hafeth Al Momani, MD, PhD

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.

Evaluation Methods:**Grading Policy:**

Grades can be based on the following:

First Exam: 25%

Second Exam: 25%

Practical Exam: 10%

Final Exam: 40%

Total Points 100

Intended Learning Outcomes (ILOs):

Upon completion of this course, the student will be able to:

- Understand the concept of medical microbiology
- Understand the bacterial cell structure, growth, nutrition and genetics
- Understand the biological nature and diversity of microorganisms
- Describe the various methods of sterilization and disinfection
- Understand the various types of antimicrobial chemotherapy
- Recognize the various types of culture media and culture methods
- Differentiate between Gram positive and Gram negative bacteria as well as mycobacteria, rickettsia, chlamydia, mycoplasma and spirochaetes
- Differentiate between the various types of fungi
- Understand the difference between protozoa and helminths
- Understand the viral structure, replication, and genetics
- Understand the pathogenesis and immunity to viral infections
- Describe the various diagnostic methods of viral infections
- Understand the concept anti-viral chemotherapy
- Differentiate between DNA and RNA viruses

General Microbiology Lectures: Topic Outline and Schedule

Week No	Lecture No	Lecture topic	Lecturer
1	1	Introduction and History of Microbiology	Dr Mohammad
	2	Bacterial Cell Structure	Dr Mohammad
2	3	Growth and Nutrition	Dr Mohammad
	4	Anti-microbial Drugs-1	Dr Mohammad
3	5	Control and Sterilization of Microorganisms	Dr Sameer
	6	Anti-microbial Drugs-2	Dr Mohammad
4	7	Gram-Positive Cocci	Dr Mohammad
	8	Gram-Positive Cocci	Dr Mohammad
5	9	Haemophilus, Bordetella, and Pseudomonads	Dr Sameer
	10	Gram-Negative Cocci	Dr Mohammad
6	11	Vibro, Brucella, Campylobacter	Dr Sameer
	12	Gram-Negative Rods (Enterobacteriace)	Dr Hafeth
7	13	Introduction to Parasitology	Dr Sameer
	14	Protozoa	Dr Sameer
8	15	Helminthes	Dr Sameer
	16	Introduction to Virology	Dr Ashraf
9	17	Viral Structure and Replication 1	Dr Ashraf
	18	Viral Structure and Replication 2	Dr Ashraf
10	19	Viral Infections Pathogenesis	Dr Ashraf
	20	Viral Immunology	Dr Ashraf
11	21	Fungi	Dr Sameer
	22	Viral Genetics	Dr Ashraf

12	23 24	Diagnosis of Viral Infections Anti-Viral agent	Dr Ashraf Dr Ashraf
13	25 26	RNA Viruses DNA viruses	Dr Ashraf Dr Ashraf
14	27 28	Revision Revision	Dr Ashraf Dr Ashraf
15		Final exam	

General Microbiology Practical Classes

Overall Objectives of the Microbiology Laboratory

- ❖ In this portion of the course, student will explore the central roles of microorganisms in nature and in our daily lives. In this process of discovery, he will become adept with standard microbiological techniques that will allow him to investigate the different lab techniques and identify the different types of microorganisms. The various sub-disciplines of Microbiology including, Bacteriology, Parasitology, and Applied Microbiology will be introduced.
- ❖ The objectives over the course of the semester are to:
 - 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.
- ❖ The experiments to be conducted in the General microbiology Laboratory are outlined in a manual, they include:
 - Laboratory orientation, instruments & equipment.
 - Laboratory Safety
 - Cultivation and isolation of bacteria
 - Culture media and colonial morphology
 - Gram stain and Ziehl-Neelsen stain
 - Biochemical tests
 - Parasitology Lab
 - Antibiotic susceptibility tests
 - Diagnostic tools in Microbiology

Learning Objective:

At the end of the lesson, the student should be able to:

- Identify the structure of bacterial cell
- Do simple and differential staining methods
- Describe the essential nutrients required for bacterial growth
- Describe the mechanisms of genetic variation in bacterial cell
- Identify the chemical means of sterilization and disinfection, and their effect on bacterial cell

- Do and interpret the result of anti-microbial sensitivity testing in vitro
- Do western blotting and PCR and interpret their results

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.

Teaching Methods and Assignments:**Development of ILOs is promoted through the following teaching and learning methods:**

- Lectures-Power Point presentations
- Departmental hand-outs
- Animations, educational movies, illustrations
- Self-readings
- Practical diagnostic classes

References:

Author	Title
Jawetz, Melnick, & Adelberg's	Medical Microbiology, Latest Edition
Bailey & Scott's	Diagnostic Microbiology, Latest Edition
Kenneth J. Ryan, C. George Ray	Sherris Medical Microbiology, Latest Edition
Collins and Lyne	Microbiological methods, Latest Edition

Additional information:**Course Policies:**

Late Assignments: According to college policy

Missed exams: According to college policy

Absence: According to college policy

Cheating: According to college policy

Classroom Protocol: According to college policy

Student rights and responsibilities: According to college policy

This course is 16 weeks total including:

- 14 teaching weeks: (2.5 theory hours and 2 practical hours for 14 weeks) = 35 lectures and 14 practical sessions
- Last two weeks for final exams according to university regulations