

Course Syllabus

1	Course title	Introduction to Microbiology and Immunology
2	Course number	0504209
3	Credit hours (theory, practical)	5 (5 theory, 0 practical)
	Contact hours (theory, practical)	75 theory
4	Prerequisites/corequisites	<ul style="list-style-type: none"> General Biology-1 Cell and Molecular Biology
5	Program title	Doctor of Medicine (M.D.)
6	Program code	
7	Awarding institution	The university of Jordan
8	School	Medicine
9	Department	Pathology, Microbiology and Forensic Medicine
10	Level of course	Undergraduate
11	Year of study and semester (s)	2 nd year, 1 st semester.
12	Final Qualification	Doctor of Medicine (M.D.)
13	Other department (s) involved in teaching the course	Pharmacology department, Faculty of Medicine.
14	Language of Instruction	English
15	Date of production/revision	September, 2019

16. Course Coordinator:

- Name: Anas Abu-Humaidan, M.D. Ph.D.
- Department of Pathology, Microbiology and Forensic Medicine, Faculty of Medicine.
- Office: Faculty of medicine, ground floor, office number 010.
- Office hours: Monday-Thursday, 10:00-11:00
- E-mail: A.abumaidan@ju.edu.jo
- Tel. number: +962779227922

17. Other instructors:

Office numbers, office hours, phone numbers, and email addresses should be listed.

18. Course Description:

This course covers the study of microorganisms with respect to classification and structure of bacteria, viruses, parasites, and fungi, their characteristics, growth and replication, and their susceptibility to antimicrobials. It also covers the study of the types of microorganisms that cause human disease, and their pathogenesis, methods of diagnosis and prevention and control. Also, the course covers the immune system including types of cells and tissues, their distribution in the body, their functions, growth, development and differentiation, antigens and their characteristics, antibodies and their types and functions, serologic reactions, the complement system and its functions and activation, interaction between cells in the generation of the immune response, and immunologic disorders including autoimmunity, hypersensitivity, tumor immunology, immunology of transplantation, and immunodeficiency diseases. Also is covered the drugs used in the treatment of these diseases.

19. Course aims and outcomes:

A- Aims:

The course is divided into 2 main parts, microbiology and immunology.

- In the microbiology part, the course aims to:
 1. Explain basic concepts in bacterial, viral, protozoal and fungal biology, including structure, metabolism, growth, and genetics. and the application of that knowledge in cultivation, classification, and identification of microbes.
 2. Describe and demonstrate common procedures done in the microbiology lab.
 3. Introduce the student to the human microbiota and its role in health and disease.
 4. Describe the infection process, including pathogenesis of microbes and ways through which they evade the immune system.
 5. Briefly introduce the student to important medical pathogens. Their classes, pathogenesis, diagnosis, and treatment.
 6. Describe methods of sterilization and antimicrobial therapy.
- In the Immunology part, the course aims to:
 7. Describe in detail the biology of the immune system, starting with cells, tissue, and molecules involved in the immune response, their development, activation, and regulation.
 8. Describe in detail the main arms of the immune system, the innate and adaptive.
 9. Explain the concept of recognition of non-self and related topics, including tolerance and autoimmunity.
 10. Explain immunopathology with examples, including types of hypersensitivity and immunodeficiencies.
 11. Introduce clinical aspects of immunology, including vaccines, serology, transplantation, tumor immunology and immunotherapy.

B- Intended Learning Outcomes (ILOs):

After completion of the course, the student is expected to:

1. Explain and discuss major concepts in microbiology and immunology (found in course aims above) and understand how microbes and the immune system interact.
2. Describe how the immune system functions in health and disease, and the drugs used to modulate it.
3. Describe, in general terms, diseases caused by important medical pathogens.
4. Recognize and discuss clinical scenarios related to infectious diseases or immunopathology.
5. Describe some of the methods used in microbiology and immunology labs.

20. Topic Outline and Schedule:

Topic	Week	Instructor	Achieved ILOs	Evaluation Methods	Reference
Introduction to Medical Microbiology	1	Ala'a	1	See: "22. Evaluation Methods"	See: "25. references"
Bacterial Classification, Structure, and Replication	1-2	Ala'a	1		
Viral Classification, Structure, and Replication	1-2	Belal	1		
Bacterial Metabolism and Genetics	2-3	Ala'a	1		
Sterilization, Disinfection, and Antisepsis	2-3	Ala'a	1		
Laboratory Diagnosis of Bacterial Diseases	4	Ala'a	5		
Laboratory Diagnosis of Viral Diseases	2-3	Belal	5		
Bacterial communities	4	Anas	1		
Mechanisms of Bacterial Pathogenesis	4-5	Anas	1		
Mechanisms of Viral Pathogenesis	4	Anas	1		
Human microbiota	6	Anas	3+4		
Important bacterial pathogens	7-12	Anas Mohammad Nader	3+4		
Exam period	10				
Important fungal and protozoal pathogens	10-12	Nader	3+4		
Important viral pathogens	5-15	Malik	3+4		
General principles of laboratory diagnosis	15	Anas	5		
Vaccines, Emerging microbial threats:	15	Anas	3		
Properties and Overview of Immune Responses	1	Anas	2		
Cells and Tissues of the Immune System	2	Anas	2		
Leukocyte Migration into Tissues	3	Anas	2		
Innate Immunity	3-4	Anas	2		
Antibodies and Antigens	4-5	Anas	2		

Major Histocompatibility Complex Molecules	5	Malik	2		
Antigen Presentation to T Lymphocytes	6	Mohammad	2		
Immune Receptors and Signal Transduction	6	Mohammad	2		
Lymphocyte Development	7	Mohammad	2		
Antigen Receptor Gene Rearrangement	7	Belal	2		
Activation of T Lymphocytes	8	Nader	2		
Effector Mechanisms of Cell-Mediated Immunity	8	Nader	2		
B Cell Activation and Antibody Production	9	Nader	2		
Effector Mechanisms of Humoral Immunity	9	Nader	2		
Immunologic Tolerance and Autoimmunity	10	Malik	2+4		
Immunity to Microbes	11	Anas	2+4		
Transplantation Immunology	11	Anas	2+4		
Immunity to Tumors	12	Belal	2+4		
Hypersensitivity Disorders	13	Nader	2+4		
Congenital and Acquired Immunodeficiencies	14	Belal	2+4		
Immunomodulatory drugs	15	Pharmacology dept.			

21. Teaching Methods and Assignments:

Development of ILOs is promoted through the following teaching and learning methods:

- Theoretical lectures.
- E-learning.
- Microbiology lab demonstrations.
- In-class discussions.
- Voluntary assignments.

22. Evaluation Methods and Course Requirements:

Opportunities to demonstrate achievement of the ILOs are provided through the following assessment methods and requirements:

- Multiple choice question (MCQ)-based exams.
- Midterm exam (40%)
- Final exam (50%)
- Attendance and voluntary assignments (10%)

23. Course Policies:

A- Attendance policies:

Attendance is mandatory and follows Faculty of Medicine rules and regulations.

B- Absences from exams and handing in assignments on time:

Absence from exams will be handled on individual basis through a specific committee, repeat exams can be provided with a valid excuse. Voluntary assignments should be handed before the deadline.

C- Health and safety procedures:

Safety procedures provided by lab instructors should be followed carefully.

D- Honesty policy regarding cheating, plagiarism, misbehaviour:

Cheating and in-class misbehaviour are never tolerated and will be dealt with according to the Faculty of Medicine rules and regulations.

E- Grading policy:

- Letter grading for successful completion of the course in descending order:

A, A-, B+, B, B-, C+, C, C-, D+, D

- Letter grading for unsuccessful completion of the course in descending order:

D-, F

F- Available university services that support achievement in the course:

- Moodle online platform for e-learning.
- University of Jordan library.

24. Required equipment:

A lab coat is needed for lab demonstrations, other safety equipment will be provided in the lab.

25. References:

- 7th or 8th or any other recent edition *Murray's medical microbiology*.
- 4th or 5th or any other recent edition *Basic immunology, Functions and Disorders of the Immune System by Abul K. Abbas*
- 26th or 27th or any other recent edition of *Jawetz, Melnick, & Adelberg's Medical Microbiology*.
- 8th or 9th or any other recent edition of *Janeway's Immunobiology*.
- Reviews, articles, and videos referred to in-lecture.

26. Additional information:

The 1st semester of the school year 2019/2020 will be the first time “Introduction to Microbiology and Immunology” is taught in a single 5 credits course. Previously, it was 2 separate courses with 3 credits to “Introduction to Microbiology” and 2 credits to “Introduction to Immunology”.

In general, each week will have 5 lectures, 3 lectures will be dedicated to Microbiology and 2 to Immunology, in order to integrate and better understand closely related concepts in both sciences.

Name of Course Coordinator: -----Signature: ----- Date: -----

Head of curriculum committee/Department: ----- Signature: -----

Head of Department: ----- Signature: -----

Head of curriculum committee/Faculty: ----- Signature: -----

Dean: ----- -Signature: -----