

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	October, 2022

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
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17. Other instructors:

Ala'a Matalka M.S. : a.matalka@ju.edu.jo
 Malik Sallam M.D. Ph.D. : malik.sallam@ju.edu.jo
 Nader Alaridah M.D. Ph.D. : n.alaridah@ju.edu.jo

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; their pathogenesis, methods of diagnosis, prevention, and control. The course will also briefly discuss principles of biorisk, biosafety, and biosecurity.

In the immunology part the course covers the types of immune 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, 1) microbiology and 2) 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.
 7. Briefly introduce the principles of biorisk, biosafety, and biosecurity
- In the Immunology part, the course aims to:
 8. 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.
 9. Describe in detail the main arms of the immune system, the innate and adaptive.
 10. Explain the concept of recognition of non-self and related topics, including tolerance and autoimmunity.
 11. Explain immunopathology with examples, including types of hypersensitivity and immunodeficiencies.
 12. 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).
2. Describe interactions between microbes and the immune system.
3. Describe how the immune system functions in health and disease, and the drugs used to modulate it.
4. Describe, in general terms, diseases caused by important medical pathogens.
5. Recognize and discuss clinical scenarios related to infectious diseases or immunopathology.
6. Describe some of the methods used in microbiology and immunology labs.

20. Topic Outline and Schedule:

Weeks	Microbiology and Immunology, 2 nd year M.D. (2022/2023)	Lecturer
Wk1 (Oct 9)	Introduction to Medical Microbiology	Alaa
	Bacterial Structure	Alaa
	Intro to Virology	Malik
	Properties and Overview of Immune Responses	Anas
	Cells of the Immune System	Anas
Wk2 (Oct 16)	Bacterial growth	Alaa
	Bacterial Metabolism	Alaa
	Viral pathogenesis	Malik
	Tissues of the Immune System	Anas
	Molecules of the Immune System	Anas
Wk3 (Oct 23)	Sterilization, Disinfection, and Antisepsis	Alaa
	Bacterial classification, identification	Alaa
	Virology	Malik
	The complement system	Anas
	Epithelial barriers and leukocyte Migration into Tissues	Anas
Wk4 (Oct 30)	Bacterial genetics and gene transmission	Alaa
	Laboratory Diagnosis of Bacterial Diseases	Anas
	Mechanisms of Viral Pathogenesis	Malik
	Immunity To extracellular pathogens	Anas
	Immunity To intracellular pathogens	Anas
Wk5 (Nov 6)	Mechanisms of Bacterial Pathogenesis	Anas
	Bacterial communities and Human microbiota	Anas
	Important viral pathogens	Malik
	Antibodies and Antigens	Anas
	Major Histocompatibility Complexes	Anas
Wk6 (Nov 13)	Important bacterial pathogens	Nader
	Important bacterial pathogens	Nader
	Virology	Malik
	Antigen Presentation to T Lymphocytes	Nader
	Immune Receptors and Signal Transduction	Nader
Wk7 (Nov 20)	Important bacterial pathogens	Nader
	Important bacterial pathogens	Nader
	Virology	Malik
	Lymphocyte Development	Nader
	Activation of T Lymphocytes	Nader
Wk8 (Nov 27)	Important bacterial pathogens	Nader
	Important bacterial pathogens	Nader
	Virology	Malik
Exams week	Effector Mechanisms of Cell-Mediated Immunity	Nader
	Antigen Receptor Gene Rearrangement	Anas
Wk9 (Dec 4)	Important bacterial pathogens	Anas
	Important bacterial pathogens	Anas
	Virology	Malik
Exams week	B Cell Activation and Antibody Production	Anas
	Effector Mechanisms of Humoral Immunity	Anas
Wk10(Dec 11)	Important bacterial pathogens	Anas
	Important bacterial pathogens	Anas
	Virology	Malik

	Immunologic Tolerance and Autoimmunity	Nader
	Transplantation Immunology	Anas
Wk11 (Dec 18)	Important bacterial pathogens	Anas
	Important bacterial pathogens	Anas
	Virology	Malik
	Immunodeficiency (1ry)	Anas
	Immunodeficiency (2ry)	Malik
Wk12 (Dec 25)	Important bacterial pathogens	Anas
	Important bacterial pathogens	Anas
	Virology	Malik
	Serologic reactions	Malik
	Hypersensitivity Disorders 1	Malik
Wk13(Jan 1)	Important bacterial pathogens	Anas
	Important bacterial pathogens	Anas
	Virology	Malik
	Hypersensitivity Disorders 2	Malik
	Tumor Immunology	Anas
Wk14(Jan 8)	Microbiology Revision	Anas
	Microbiology Revision	Anas
	Virology	Malik
	Immuno-pharmacology	Pharm dep
	Immuno-pharmacology	Pharm dep
Wk15(Jan 15)	Microbiology Revision	Anas
	Microbiology Revision	Anas
	Virology	Malik

21. Teaching Methods and Assignments:

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

- In person lectures.
- Online lectures on YouTube.
- Online meetings on Microsoft teams.
- Microbiology lab demonstrations.
- 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 (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:

- Microsoft teams
- 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:

- **Abbas, Abul K. Cellular and molecular immunology/Abul K. Abbas, Andrew H. Lichtman, Shiv Pillai; illustrations by David L. Baker, Alexandra Baker. — 7th ed.**
- **Black, Jacquelyn G., Black, Laura J. Microbiology: principles and explorations/Jacquelyn G. Black. —9th ed.**
- 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:

In general, each week will have 5 lectures, 2 lectures will be dedicated to Microbiology, 2 to Immunology, and 1 for Virology.

Name of Course Coordinator: Anas Abu-Humaidan Signature:  Date: 01-10-2022

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

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

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

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