Course E-Syllabus

1	**Course title**	Immunology and serology
2	**Course number**	0308361
3	**Credit hours**	3 hours
	Contact hours (theory, practical)	(2 hrs theory + 3 hrs practical)
4	**Prerequisites/corequisites**	0308242 and 0308251
5	**Program title**	Clinical Laboratory Sciences
6	**Program code**	0308
7	**Awarding institution**	The University of Jordan
8	**School**	Science
9	**Department**	Clinical Laboratory Sciences
10	**Level of course**	3th Year
11	**Year of study and semester (s)**	second semester 2023/2024
12	**Final Qualification**	Bachelor of Clinical Laboratory Sciences
13	**Other department (s) involved in teaching the course**	NA
14	**Language of Instruction**	English
15	**Teaching methodology**	√ Face to face
16	**Electronic platform(s)**	√Moodle √Microsoft Teams ☐Skype ☐Zoom ☐Others……
17	**Date of production/revision**	22nd Feb 2024

18 Course Coordinator:

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19 Other instructors:

Name:
Office number:
Phone number:
Email:

20 Course Description:

This course aims to introduce students to basic concepts of immunology. Also, to acquaint students with immunological implications in medicine, research and pharmaceutical industry. The theoretical part of the course will deal with the basic component of the immune system, mechanisms of immune response both humoral and cell mediated. In addition, the immune response in health and in disease. The practical part of the course aims to provide hands on experience in assessing various immunological reactions and their use in diagnostic medicine as well as in biomedical research. Certain assays, which are long-term or too expensive, will only be demonstrated to familiarize the students.

21 Course aims and outcomes:

- Aims:

The aim of this course to provide understanding of the basic aspects of immunology. The first few weeks the focus will be on innate immune response and inflammation. Next, the course will be on acquired immunology covering the cellular and molecular immunology. Finally, the main area of study will be about immunity and disease and the diagnostic methods.

B- **Students Learning Outcomes (SLOs):**

For purposes of mapping the course SLOs to the Clinical Laboratory Sciences program SLOs, at the successful completion of the program, graduates are expected to be able to:

SLO(1). Understand and apply the theoretical foundations of medical laboratory sciences to accurately calibrate and operate advanced laboratory equipment.

SLO(2). Demonstrate knowledge of safety protocols, Ministry of Health regulations, and environmental preservation practices when handling samples of pathogens and chemical/biological risks.

SLO(3). Acquire in-depth technical knowledge to stay abreast of scientific advancements and actively participate in local and global applied research in the field.

SLO(4). Perform diverse analyses and effectively interpret results for various clinical samples across laboratory disciplines such as hematology, clinical chemistry, microbiology, urine analysis, body fluids, molecular diagnostics, and immunology.

SLO(5). Apply practical training to solve complex problems, troubleshoot issues, and interpret results, ensuring a connection between data and specific medical conditions for precise diagnosis.

SLO(6). Show effective communication skills to convey information accurately and appropriately in a laboratory setting.

SLO(7). Demonstrate a commitment to lifelong learning and innovation by applying modern techniques, critically analyzing information, and contributing to the creation and application of new knowledge in medical laboratory sciences which fulfil the requirements of national and international CBD.

SLO(8). Uphold professional behavior, ensuring the confidentiality of client information, and respecting client privacy throughout all aspects of laboratory work.

SLO(9). Apply managerial skills that align with quality assurance, accreditation, quality improvement, laboratory education, and resource management, showcasing competence in the effective administration of laboratory practices.

Descriptors	ILO/ID	Program SLOs / Course SLOs	SLO (1)	SLO (2)	SLO (4)	SLO (5)
Knowledge	A1	Define the key components of the immune system, including cells, tissues, and organs involved in both innate and adaptive immunity.	X			
	A2	Explain the mechanisms of antigen recognition, processing, and presentation by immune cells.	X			
Skills	B1	Perform serological tests such as agglutination, precipitation, and immunofluorescence accurately and safely in a laboratory setting.		X		
	B2	Analyze serological and immunological test outcomes to determine the presence or absence of specific antibodies, antigens, or immune markers associated with various diseases.			X	
Competences	C1	Correlate test results with clinical presentations to aid in disease diagnosis and monitoring			X	
	C2	Demonstrate proficiency in performing various serological techniques, including ELISA, Western blotting, and immunofluorescence assays, with accuracy and precision.				X

22. Topic Outline and Schedule:

Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
1	1.1	Introduction to the immune system : nomenclature, general properties, and components	A1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch1
	1.2	Cells of the immune system and tissues of the immune system	A1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch1
2	2.1	Innate immunity : the early defense against infections general features and specificity of innate immune responses	A2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch2
	2.2	Components of innate immunity and innate immune reactions	A1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch2
3	3.1	Role of innate immunity in stimulating adaptive immune responses.	A1. A2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch3
	3.2	Antigen capture and presentation to lymphocytes : what lymphocytes see	A2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch3
4	4.1 4.2	Structure and function of major histocompatibility complex molecules	A1.A2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch4
5	5.1	Processing and presentation of protein antigens	A2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch5

Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
	5.2	Antigen recognition by b cells and other lymphocytes	A1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch5
6	6.1	Antigen recognition in the adaptive immune system	A1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch6
	6.2	Antigen receptors of lymphocytes	A1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch6
7	7.1	Development of immune repertoires	A1, A2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch7
	7.2	Tcell–mediated immunity activation of t lymphocytes by cell-associated antigens	A1, A2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch7
8	8.1	phases of t cell responses	A2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch8
	8.2	Biochemical pathways of t cell activation	A2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch8
9	9.1	humoral immune responses : activation of b lymphocytes and production of antibodies	A1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch9
	9.2	Phases and types of humoral immune responses	A1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch9
10	10.1	Antibody responses to t-independent antigens	A1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch10
	10.2	Regulation of humoral immune responses: antibody feedback	A1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch10
11	11.1	Effector mechanisms of humoral immunity: elimination of extracellular microbes and toxins	A1	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch11
	11.2	Properties of antibodies that determine effector function	B1,	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch11
12	12.1	Opsonization and phagocytosis	A1. A2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch12
	12.2	Antibody-dependent cellular cytotoxicity	A1. A2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch12
13	13.1	Evasion of humoral immunity by microbes	A1. A2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch13
	13.2	Vaccination	A1. A2, B1, B2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch13
14	14.1	Immunological tolerance and autoimmunity : self–nonself discrimination in the immune system and its failure	A1. A2, B1, B2, C1, C2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch14
	14,2	Immune responses against tumors and transplants immunity to noninfectious transformed and foreign cells	A1. A2, B1, B2, C1, C2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch14
15	15.1 15.2	Hypersensitivity disorders caused by immune responses	A1. A2, B1, B2, C1, C2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch15

Week	Lecture	Topic	Student Learning Outcome	Learning Methods (Face to Face/Blended/ Fully Online)	Platform	Synchronous / Asynchronous Lecturing	Evaluation Methods	Resources
16	16.1 16.2	Congenital and acquired immunodeficiencies diseases caused by defective immunity	A1. A2, B1, B2, C1, C2	Face to Face	Lecture Room	Synchronous	Quiz, Exam	Ch15

- Teaching methods include: Synchronous lecturing/meeting; Asynchronous lecturing/meeting
- Evaluation methods include: Homework, Quiz, Exam, pre-lab quiz…etc

23 Evaluation Methods:

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

Evaluation Activity	Mark	Topic(s)	Period (Week)	Platform
Midterm exam	20%	Material covered (1-7 weeks)	7 th week	Class Room
Final exam	50%	All topics are included	14 th week	Class Room
Lab final exam	20%	All topics are included	14 week	Computerized
Reports	10%	Enzyme Linked Immunosorbent Assay (ELISA).	Week 5	Class Room

24 Course Requirements (e.g: students should have a computer, internet connection, webcam, account on a specific software/platform…etc):

Student are **required** to have access to the following:
- A computer (with webcam & microphone)
- Active and dependable internet connection
- E-Learning website (not the mobile application) works smoothly on their computer.
- Make sure to install the application (platform) which will be used by your instructor to conduct the live meetings (Microsoft Teams).

25 Course Policies:

A- Attendance policies:

Students are expected to attend class and to complete all the assignments. Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant 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.

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

The student is responsible for providing satisfactory evidence to the instructor to substantiate the reason for absence within 3 days of the last date of the absence. The excuse should be acceptable and approved by the Dean. If the absence is excused, the instructor must either provide the student an opportunity to make up any quiz, exam or other work that contributes to the final grade by a date agreed upon by the student and instructor.

D- Honesty policy regarding cheating, plagiarism, misbehavior:

A range of possible sanctions exist for cases of academic dishonesty. In addition to an academic penalty (determined by the faculty member), disciplinary sanctions may also be applied.

E- Grading policy:

Midterm Exam:	20%
Final Exam:	50%
Lab Final	20%
Lab Reports + Attitude	10%

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

Library and Internet resources

26 References:

A- Required book (s), assigned reading and audio-visuals:

Basic Immunology: Functions and Disorders of the Immune System

1. by Abul K. Abbas MBBS, Andrew H. Lichtman MD PhD, et al. | May 29, 2023

B- Recommended books, materials, and media:

3. Books:
4. Immunology & Serology in Laboratory Medicine, 5th Edition by Mary Louise Turgeon
5. Journals:

Immunity , Annual Reviews of Immunology , Journal of Immunobiology

27 Additional information:

Practical work (10 Experiment)

Lab # 1.	The Immune System Organs and Cells (Histology and Anatomy).	
Lab # 2.	Agglutination Reactions I	
Lab # 3.	Agglutination Reactions II	
Lab # 4.	Protein Electrophoresis (Serum Protein Electrophoresis).	***-Report 1***
Lab # 5.	Enzyme Linked Immunosorbent Assay (ELISA).	
Lab # 6.	Double Immunodiffusion (Ouchterlony).	***-Report 2***
Lab # 7.	Isolation of Human Peripheral Blood Mononuclear Cells.	
Lab # 8.	Mixed Lymphocyte Reaction.	***-Report 3***
Lab # 9.	Flow ***Cytometry***	***- Assignment***
Lab # 10.	Monoclonal Antibody Technology	

Reference:

Current Protocols in Immunology
Online ISBN: 9780471142737
DOI: 10.1002/0471142735
Some of the experiments state the principle of the routine serologic procedures performed in the clinical laboratory. Student will be able to read and correctly follow instructions provided in reagent package inserts, as needed, to obtain valid results.
Attendance to practical classes is 100% compulsory

Name of Course Coordinator: **Dr. Suzan Matar** Signature: *Suzan Matar* Date: 2-2024

Head of Curriculum Committee/Department: **Dr. Suzan Matar** Signature: *Suzan Matar*

Head of Department: **Dr. Ahmed Abu siniyeh** Signature: *Ahmed Abu siniyeh*

Head of Curriculum Committee/Faculty: **Dr. Muayyad Al Hseinat** Signature: *Muayyad Al Hseinat*

Dean**: Prof. Mahmoud Jaghoub** Signature: *Mahmoud Jaghoub*