Republic of Yemen

Ministry of Higher Education & Scientific Research

21 September university for medical & applied sciences

Faculty of Laboratory medicine..

Department of MICROBIOLOGY & IMMUNOLOGY

Course Specification of Advanced Medical Immunology II

Course No. (03.12. 319)

2020/2021

Prepared by:	Reviewed by:	Head of the Department:	Vice Dean for Quality affairs	Dean of College:
Dr\Gamil Taher Abdul Mughni	Assistant Prof. Dr Ghamdan Al-Tahish	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	Assistant prof. Dr. Ebtesam Al-Zabedi

I. Course Identification and General Information:

1	**Course Title:**	Advanced Medical Immunology II			
2	**Course Code & Number:**	03.12. 319			
3	**Credit Hours:**	**Theory Hours**			
		Lecture	**Exercise**	Practical	**Credit Hours**
		2	0	0	2
4	**Study Level/ Semester at which this Course is offered:**	1st Level / 2nd Semester			
5	**Pre –Requisite (if any):**	Advanced Medical immunologyI			
6	**Co –Requisite (if any):**	None			
7	**Program (s) in which the Course is Offered:**	Master Degree In Microbiology & Immunology			
8	**Language of Teaching the Course:**	English			
9	**Study System:**	Semester			
10	**Mode of Delivery:**	Regular			
11	**Location of Teaching the Course:**	University Campus			
12	**Prepared by:**	Dr. Gamil Taher Abdul Mughni			
13	**Date of Approval:**				

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II. Course Description:

This course is designed to provide an in-depth understanding of the cellular and molecular mechanisms underlying the immune response. The course will cover the cellular components of the immune system, including T and B cells, dendritic cells, and macrophages, as well as the molecular processes involved in antigen recognition, processing, and presentation. Topics to be covered include immune cell signaling, cytokine regulation, immune cell development, immune surveillance, immune evasion, and immunotherapy. The course will also cover current research topics in cellular and molecular immunology.

III. Alignment Course Intended Learning Outcomes with program outcomes

	III. Course Intended Learning Outcomes (CILOs)	Referenced PILOs
A.	**Knowledge and Understanding:** **Upon successful completion of the course, students will be able to:**	
a1	**Describe** the cellular and molecular components of the immune system and explain their roles in immune responses.	**A2**
B.	**Intellectual Skills:** **Upon successful completion of the course, students will be able to:**	
b1	**Illustrate** the molecular mechanisms of antigen recognition, processing, and presentation	B1
D.	**Transferable Skills:** **Upon successful completion of the course, students will be able to:**	
d1	**Communicate** effectively about immunology to a variety of audiences	D1

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IV. Alignment Course Intended Learning Outcomes with Teaching Strategies and Assessment methods :			
(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	**Describe** the cellular and molecular components of the immune system and explain their roles in immune responses.	Lectures	Exam
(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	**Illustrate** the molecular mechanisms of antigen recognition, processing, and presentation	Lectures Practical session	Exam
C Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	**Communicate** effectively about immunology to a variety of audiences	Lectures Practical session	Seminar

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III. Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes
1	Introduction to Cellular and Molecular Immunology	- Overview of the immune system - Cellular and Molecular components of the immune system - Innate vs. adaptive immunity	1	2	a1,b2,c1
2	T-Development	-Lymphocyte Development and -Antigen Receptor Gene -Rearrangement -Positive and negative selection	1	2	a1,b2,
3	B-Development		1	2	a1,b2,
4	Innate immunity -Antigen Recognition - Structure and function of	Structure and function of immune receptors 1-Innate - Pattern recognition receptor	1	2	a1,b2,
	Macrophages Dendritic Cells Mast Cells Natural Killer Cells Inflammation	Development of macrophages Monocytes Tissue macrophages Macrophages receptors Toll-like receptors (TLRs) Cytokine receptors Macrophages activation Phagocytosis Release of cytokines Macrophages effector functions Phagocytosis Release of cytokines Cell lysis Macrophages regulation	1	2	a1,b2,
	Antigen processing and presentation	Major Histocompatibility Complex Molecules Class I MHC Molecules Class II MHC Molecules		2	a1,b2,
6	Adaptive Immune System	Antigen Recognition, Antigen processing Antigen presentation	1	2	a1,b2,

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7	T Lymphocytes	- T cell activation and differentiation - Immune Receptors and Signal Transduction - Signal transduction pathways and intracellular signaling molecules	1	2	a1,b2,
8	Effector Mechanisms of T Cell–Mediated Immunity	T-helper cells (Th1, Th2, Th17) Regulatory T-cells	1	2	a1,b2,
9	Cytotoxic T-cells	-Development of CTLs -CTL receptors -CTL activation -CTL effector functions -CTL regulation -Role of CTLs in the : -Immune response -Therapies	1	2	a1,b2,
10	NK cells	• Development of NK cells • NK receptors • NK activation • NK effector functions • NK regulation	1	2	a1,b2,
11	B cell	-B-cell activation -maturation -Differentiation -Activation - Signal transduction pathways and intracellular signaling molecules	1	2	a1,b2,
12	B&T-cells signaling		1	2	a1,b2,
13	Cytokine	Cytokine signaling: Janus kinase (JAK)/signal transducer and activator of transcription (STAT) pathways and nuclear factor kappa B (NF-κB) pathways	2	4	a1,b2,
14	Immune cell trafficking:	-Migation -adhesion -Cytokines -Chemkines - Cytokine signaling and regulation			a1,b2,d1
	Immunotherapy	checkpoint inhibitors adoptive cell therapy monoclonal antibodies			a1,b2,

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	Cell surface molecules involved in immune response.				a1,b2,
	Stem cell and the immune system				a1,b2,
	Final exam		1		a1,b2,
	Number of Weeks /and Units Per Semester			32	

V. Teaching Strategies of the Course:

1-	Lectures
2-	Practical session
3-	**Group research**

VI. Assessment Methods of the Course:

No	Assignment	
1	**Written Exams (Short Essays) and Quizzes**	a1,b2,
2	Written Exams(MCQ)	a1,b2,
3	Student presentation	a1,b2,

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VII. Assignments:

No.	Assignments	Week Due	Mark	Proportion of Final Assessment	Aligned CILOs (symbols)
1	**Midterm Exam**	7	25	25%	a1,b2
2	**Activity**	Throughout the semester	5	5%	a1,b2
5	**Final Exam**	14	70	70%	a1,b2
Total					

IX. Learning Resources:

· Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).

1- Required Textbook(s) (maximum two).

1-	Janeway's Immunobiology, 9th edition, by Kenneth Murphy, Paul Travers, and Mark Walport.
2-	Cellular and Molecular Immunology" by Abul K. Abbas, Andrew H. Lichtman, and Shiv Pillai. This textbook is known for its clear explanations of complex topics in immunology, and has a strong focus on cellular and molecular mechanisms.

2- Essential References.

1-	Basic Immunology: Functions and Disorders of the Immune System" by Abul K. Abbas and Andrew H. Lichtman
2-	Principles of Immunology by Ivan Roitt, Peter Delves, and Seamus Martin - This

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	textbook provides a comprehensive introduction to immunology, covering both the cellular and molecular aspects of the immune response

3- Electronic Materials and Web Sites etc.

1-	The Immunology Database and Analysis Portal - https://www.immunedb.com/
2-	The National Institute of Allergy and Infectious Diseases – https://www.niaid.nih.gov/
3-	The Journal of Immunology – https://www.jimmunol.org/
4-	The Immune System and Immunology - https://www.ncbi.nlm.nih.gov/books/NBK279364/
	The American Association of Immunologists - https://www.aai.org/

XI. Course Policies:

1	**Class Attendance:** Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	**Tardiness:** -If the student dose not attend for more than 6 times, the student will be obligated to withdrew from the course
3	**Exam Attendance/Punctuality:** No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	**Assignments & Projects:** Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.

5	**Cheating:** Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	**Forgery and Impersonation:** Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
7	**Other policies:** The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration