Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED

SCIENCES

Faculty of Laboratory medicine..

Department of MICROBIOLOGY & IMMUNOLOGY

Course Specification of **Advanced medical immunology I**

Course No. (03.12. 314)

2022/2023

Prepared by:	Reviewed by:	Head of the Department:	Vice Dean for Quality affairs	Dean of College:
Dr\Gamil Taher Abdul Mughni	Dr\ DrNawal Al-Henhena	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ehtesam Al-Zabedi

I. Course Identification and General Information:

1	**Course Title:**	Advanced Medical immunology I			
2	**Course Code & Number:**	(03.12. 314)			
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 / 1st Semester			
5	**Pre –Requisite (if any):**	None			
6	**Co –Requisite (if any):**	None			
7	**Program (s) in which the Course is Offered:**	Master degree in Medical 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:**				
13	**Date of Approval:**	2022-2023			

II. Course Description:
Advanced Immunology is provides an in-depth understanding of the immune system. The course covers a wide range of topics, including: The structure and function of the immune system, cellular and molecular mechanisms of immunity, Antigen processing and presentation, Tissue-specific immune responses,Immune-mediated pathologies and Vaccination

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 structure and function of the immune system.	A2
a2	Discuss the immune responses to infection, tumors, allergens, and autoimmunity	a4
B. Intellectual Skills: ***Upon successful completion of the course, students will be able to:***		
b1	**Explain** the cellular and molecular basis of immunity	B1
b2	**Illustrate** the immune responses damage and potential immunotherapy for the treatment of disease	B2
C. Professional and Practical Skills: ***Upon successful completion of the course, students will be able to:***		
c1	**Perform** different immunological diagnostic assay such as agglutination, precipitation, Enzyme-linked immunosorbent assay, Western blotting etc.	C1
c2	**Evaluate** the potential of immunotherapy for the treatment of disease	C2
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 structure and function of the immune system.	Lectures	Exam
	Discuss the immune responses to infection, tumors, allergens, and autoimmunity	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	**Explain** the cellular and molecular basis of immunity	Lectures	Exam
B2	**Illustrate** the immune responses damage and potential immunotherapy for the treatment of disease	Lectures	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
c1	**Perform** different immunological diagnostic assay such as agglutination, precipitation, Enzyme-linked immunosorbent assay, Western blotting etc.	Lectures, pactical	Exam pactical
C2	**Evaluate** the potential of immunotherapy for the treatment of disease	Lectures, pactical	Exam pactical

(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	Exam

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Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes
1	Introduction of Immunology	- eveiwe Historical background about the development of the discipline of immunology. -Definition immunology - Definition immunological terms. -Classification of immune system	1	2	a2,a4.b1,b2,c1,c 2,d3
2	Organs and Cells of the immune system	-Describe the organs, tissue, cells of the immune system - Cells innate immune response - Antigen presenting cells and large granular lymphocytes - Cells Adaptive immune response	1	2	a2,a4.b1,b2,c1,c 2,d3
3	Innate or Natural immunity	Definition 1-Components and functions of the natural immune defense system. -Differentiate between the main features of natural and adaptive immunity Recognize (PAR)	1	2	a2,a4.b1,b2,c1,c 2,d3
4	**Cellular defense mechanism** Phagocytosis, Cytotoxicity (NK cells) and inflammation	**-Definition** **-Type** **-Step** **-Mechanism of killing**	1	2	a2,a4.b1,b2,c1,c 2,d3
5	Antigens	**Definition** : Antigen Immunogen Adjuvant Hapten. – Types and properties of antigen,	1	2	a2,a4.b1,b2,c1,c 2,d3
6	Complement system	**-Definition** **-Properties** -Aactivation pathways:	1	2	a2,a4.b1,b2,c1,c 2,d3

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		Classical Alternative lectin pathway. -Function **-Regulation**			
7	Med term exam		1		
	Antibodies structural	**Definition** : Immunoglobulin (Ig) **Describe** the structure and function of the Immunoglobulin **-Evaluate** the components of Ig molecule in relation to its function.		2	a2,a4.b1,b2,c1,c2,d3
8		-Explain the components of Ig molecule and classification into classes and subclasses of Immunoglobulins. Illustrate the components of Ig which interaction with antigens , interaction with receptors on inflammatory cells and other molecules. Immunoglobulins in disease process.	1		
9	Adaptive immunity:	Define Properties Cells mechanisms of humeral and cell-mediated immunity	3	2	a2,a4.b1,b2,c1,c2,d3
10	Humoral	Define Properties Cells T-dependent T- independent in the activation of B lymphocytes. Describe the transformation of activated B cells into plasma cells. recognize that plasma cells are the cells that synthesize Immunoglobulins (antibodies). describe the control mechanism of antibody mediated response.	1	2	a2,a4.b1,b2,c1,c2,d3

		know techniques of Immunoglobulins measurement			
11	cellular	Define Properties Cells understand the activation of different T lymphocyte subpopulations and subsets. Compare T Cell Receptor (TCR) and B Cell Receptor (BCR) to show similarity and dissimilarity in relation to function To describe the mechanism of cytotoxicity by cytotoxic T lymphocyte (CTL) and other cell. To understand the control mechanism of CMI response.	2	6	a2,a4.b1,b2,c1,c 2,d3
12	Cytokine	-Definition the different terms for cytokines nomenclature. -Classification and function of different cytokines. -Mode of action and effects on immune functions. -chmokinyes function. -role of cytokines in health and disease.	1	2	a2,a4.b1,b2,c1,c 2,d3
13	Vaccines	-Difine -Type -	1	2	a2,a4.b1,b2,c1,c 2,d3
14	Final exam		1	2	
Number of Weeks /and Units Per Semester			**16**	**32**	

B - Practical Aspect: (if any)				
Order	**Tasks/ Experiments**	**Number of Weeks**	**contact hours**	**Learning Outcomes**
1	**Introduction of Antigen-Antibody Interactions and Immunodiagnostic**			a2,a4.b1,b2,c1,c2,d3
2	**Immuno-agglutination technique**			a2,a4.b1,b2,c1,c2,d3
3	**Precipitation technique**			a2,a4.b1,b2,c1,c2,d3
4	**ELISA technique**			a2,a4.b1,b2,c1,c2,d3
5	**Serodiagnosis of Hepatitis B Virus and Hepatitis C Virus.**			a2,a4.b1,b2,c1,c2,d3
Number of Weeks /and Units Per Semester				

V. Teaching Strategies of the Course:	
1-	Lectures
2-	Practical session
3-	Self leaning
4-	**Group research**

VI. Assessment Methods of the Course:		
No	**Assignment**	
1	**Written Exams (Short Essays) and Quizzes**	a2,a4.b1,b2,c1,c2,d3
2	Written Exams(MCQ)	a2,a4.b1,b2,c1,c2,d3
3	Structured Oral Exams	a2,a4.b1,b2,c1,c2,d3
4	Objective Structured Practical Exams (OSPE)	a2,a4.b1,b2,c1,c2,d3
5	Student presentation	a2,a4.b1,b2,c1,c2,d3

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VII. Assignments:

No.	Assignments	Week Due	Mark	Proportion of Final Assessment	Aligned CILOs (symbols)
1	**Midterm Exam**	7	15	15%	a2,a4.b1,b2,c1,c2,d3
2	**Activity**	Throughout the semester	5	5%	a2,a4.b1,b2,c1,c2,d3
3	Practical Report	Throughout the semester	10	10 %	a2,a4.b1,b2,c1,c2,d3
4	**Practical exam**	12	20	20%	a2,a4.b1,b2,c1,c2,d3
5	**Final Exam**	14	50	50%	a2,a4.b1,b2,c1,c2,d3
Total					

Learning Resources:

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

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

1- lecture note
2- Kuby Immunology, 10th Edition,2019:Jenni Punt; Sharon Stranford; Patricia Jones; Judy Owen

2- Essential References.

1-Roitt's Essential Immunology, 13th Edition. 13thEdition, Peter J. Delves et al., Wiley-Blackwell, 2017.
2-Cellular and Molecular Immunology 10th edition, Abul K. Abbas, ELSVIEVER, 2021.

3- Electronic Materials and Web Sites *etc.*

1- https://www.youtube.com/results?search_query=Dr.+Saleh+Bahaj
2-https://onlinelearning.hms.harvard.edu/hmx/courses/immunology/
3- https://www.edx.org/learn/immunology
4- https://onlinelearning.hms.harvard.edu/hmx/courses/hmx-immunology/
-https://immunology.utoronto.ca/online-learning

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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

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 Bacteriology

Course No. (03.12. 313)

2022/2023

Prepared by:	Reviewed by:	Head of the Department:	Vice Dean for Quality affairs	Dean of College:
Prof. Dr. Khaled A. Al-Moyed	Dr. Gamil Taher Abdul Mughni	Dr. Gamil Taher Abdul Mughni	Dr. Gamil Taher Abdul Mughni	Ass.Prof. Ebtesam Al-Zabedi

I. Course Identification and General Information:					
1	Course Title:	Advanced Medical Bacteriology			
2	Course Code & Number:	03.12. 313			
3	Credit Hours:	Theory Hours			
		Lecture	Exercise	Practical	Credit Hours
		2	0	2	3
4	Study Level/ Semester at which this Course is offered:	1st Level / 1st Semester			
5	Pre –Requisite (if any):	None			
6	Co –Requisite (if any):	None			
7	Program (s) in which the Course is Offered:	Master degree of microbiology and 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:	Prof. Dr. Khaled A.AL-Moyed			
13	Date of Approval:	2022-2023			

Prepared by:	Reviewed by:	Head of the Department:	Vice Dean for Quality affairs	Dean of College:
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I. Course Identification and General Information:					
1	Course Title:	Advanced Medical Bacteriology			
2	Course Code & Number:	03.12. 313			
3	Credit Hours:	Theory Hours			
		Lecture	Exercise	Practical	Credit Hours
		2	0	2	3
4	Study Level/ Semester at which this Course is offered:	1st Level / 1st Semester			
5	Pre –Requisite (if any):	None			
6	Co –Requisite (if any):	None			
7	Program (s) in which the Course is Offered:	Master degree of microbiology and immunology			
8	Language of Teaching the Course:	English			
9	Study System:	Semester			
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11	Location of Teaching the Course:	University Campus			
12	Prepared by:	Prof. Dr. Khaled A.AL-Moyed			
13	Date of Approval:	2022-2023			

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II. Course Description:

This course provides an in-depth study of the structure, function, and pathogenesis of bacteria. Topics include the morphology, physiology, genetics, and biochemistry of bacteria; the mechanisms of bacterial pathogenesis; the diagnosis and treatment of bacterial infections; and the prevention of bacterial infections.

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** an in-depth of bacterial physiology, including growth, replication, and metabolism.	A2
a2	**Discuss** the mechanisms of bacterial pathogenesis	A4
B. Intellectual Skills: ***Upon successful completion of the course, students will be able to:***		
b1	**Explain** the genetic mechanisms that underlie bacterial pathogenesis, the principles of bacterial genetics and antibiotic resistance.	B1
b2	**Design** guidelines for prevention, control of infection/disease and antibiotic treatment regimens used for managing microbial and immunological diseases.	B3
C. Professional and Practical Skills: ***Upon successful completion of the course, students will be able to:***		
c1	**Identify** and characterize microbial pathogens	C1
D. Transferable Skills: ***Upon successful completion of t0he course, students will be able to:***		
d1	**Communicate** effectively through oral presentations, computer processing and presentations, and written reports.	D2

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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** an in-depth of bacterial physiology, including growth, replication, and metabolism.	Lectures	Exam
a2	**Discuss** the mechanisms of bacterial pathogenesis	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	**Explain** the genetic mechanisms that underlie bacterial pathogenesis, the principles of bacterial genetics and antibiotic resistance.	Lectures	Exam
b2	**Design** guidelines for prevention, control of infection/disease and antibiotic treatment regimens used for managing microbial and immunological diseases.	Lectures	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
c1	**Identify** and characterize microbial pathogens	Lectures	Exam

(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 through oral presentations, computer processing and presentations, and written reports.	Lectures	Exam

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Course Content:

A – Theoretical Aspect:

Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes
1	Structure and function of bacteria	**Describe** the basic structure and function of bacteria	1	2	a1,a2,b1,b2,c1,d1
2	Genetics and biochemistry of bacteria	**Discuss** the genetics and biochemistry of bacteria	1	2	a1,a2,b1,b2,c1,d1
3	Mechanisms of bacterial pathogenesis	**Explain** the mechanisms of bacterial pathogenesis	1	2	a1,a2,b1,b2,c1,d1
4	Diagnose, treatment and Prevent bacterial infections	**Diagnose** and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1
5	**Gram's- positive Cocci** 1. ***Staphylococci*** (pyogenic cocci and coagulase-negative staphylococcus) a) Morphology, culture, and biological characteristics of *Staphylococcus aureus* b) The virulence factors of *Staphylococcus aureus* and their effects (including	**Diagnose** and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1

	SPA, coagulase, hemolysin, and enterotoxin) c) The diagnostic laboratory tests for *Staphylococcus aureus* and the principles of controlling Staphylococcus infections				
6	2. ***Streptococcus*** (classification)	diseases, virulence factors Morphology, culture, and characteristics diagnostic laboratory	1	2	
7	**Gram's- negative cocci:**	**3.Neisseria:** a) Classification of Neisseria (Neisseria meningitides and Neisseria gonorrhoeae) b) The biological characteristics and pathogenicity of - and immune response to - Neisseria meningitides c) Principles of diagnostic laboratory tests, and principles of prevention and treatment of the diseases caused by *Neisseria meningitides* d) *Neisseria gonorrhoeae* and infection	1	2	a1,a2,b1,b2,c1,d1
8	**Gram-positive rods** (None spore forming), **Aerobic**	**Diagnose** and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1

	Bacillus anthracis *Bacillus cereus* *Listeria monocytogenes* *Corynebacterium diptheriae* *Actinomycetes, norcardiosis and actinomycetoma*				
9	**Gram-positive rods** (Spore forming, anaerobes), 1. Overview: *Clostridia* , spore forming a) The main biological characteristics of Clostridia (C. *tetani*, C. *botulinum* and C. perfringens). b) Infection and Pathogenesis of Clostridia (tetanospasimin, and *Botulinum* toxin, toxin of *C. perfringens*) and immunity c) Diagnostic laboratory tests for the diseases cause by Clostridia d) Treatment and prevention of Clostridia diseases	**Diagnose** and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1
10	**Gram-Negative Rods** Related to the Enteric Tract *Enterobacteriaceae* pathogens both within & outside the enteric tract *Escherichia* *Salmonella* pathogens primarily within the enteric tract *Shigella* *Vibrio* *Campylobacter* *Helicobacter*	**Diagnose** and treat bacterial infections Prevent bacterial	1	2	

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	pathogens outside the enteric tract *Klebsiella -Enterobacter- Serratia Group* *Proteus--Providencia- Morganella Group* *Pseudomonas* *Bacteroides & Prevotella* *Fusobacterium*				
	Minor ***gram-positive rods*** Pathogens Bacteria of Minor Medical			2	a1,a2,b1,b2,c1,d1
11	Importance *Abiotrophia* *Achromobacter* *Actinobacillus (Aggregatibacter)* *Aeromonas* *Alcaligenes* *Arachnia* *Arcanobacterium* *Arizona* *Bartonella quintana & Bartonella bacilliformis* *Bifidobacterium* *Bradyrhizobium* *Branhamella* *Burkholderia pseudomallei* *Calymmatobacterium* *Capnocytophaga* *Cardiobacterium* *Chromobacterium* *Chryseobacterium* *Citrobacter* *Corynebacterium jeikeium* *Corynebacterium minutissimum* *Edwardsiella*	**Diagnose** and treat bacterial infections Prevent bacterial	1		

	Eikenella *Erwinia* *Erysipelothrix* *Eubacterium* *HACEK Group* *Haemophilus aegyptius* *Haemophilus ducreyi* *Hafnia* *Kingella* *Lactobacillus* *Micrococcus* *Mobiluncus* *Moraxella* *Peptococcus* *Peptostreptococcus* *Plesiomonas* *Porphyromonas* *Propionibacterium* *Rhodococcus* *Sarcina* *Spirillum* *Streptobacillus* *Streptococcus suis* *Tropheryma* *Veillonella* *Wolbachia* *Yersinia enterocolitica &* *Yersinia pseudotuberculosis*				
12	Gram-Negative Rods Related to the Respiratory Tract Introduction *Haemophilus* *Bordetella* *Legionella* *Acinetobacter*	**Diagnose** and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1
13	**Gram-Negative Rods**		1	2	a1,a2,b1,b2,c1,d1

	Related to Animal Sources (Zoonotic Organisms) Introduction *Brucella* *Francisella* *Yersinia* *Pasteurella* *Bartonella*				
14	**Mycobacteria** **Introduction** *Mycobacterium tuberculosis* **Atypical mycobacteria** *Mycobacterium leprae*	**Diagnose** and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1
	Spirochetes Introduction Treponema *1. Treponema pallidum* *2. Nonvenereal treponematoses* *Borrelia* *1. Borrelia burgdorferi* *2. Borrelia recurrentis &* *Borrelia hermsii* *3. Borrelia miyamotoi* *Leptospira* *Other Spirochetes*	**Diagnose** and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1
1	**Mycoplasmas** Introduction *Mycoplasma pneumoniae*	**Diagnose** and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1
16	**Chlamydiae** Introduction *Chlamydia trachomatis* *Chlamydia pneumoniae* *Chlamydia psittaci.*	**Diagnose** and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1
	Rickettsiae Introduction *Rickettsia rickettsii &* *Rickettsia prowazekii* *Coxiella burnetii*	**Diagnose** and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1

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	Anaplasma phagocytophilum *Ehrlichia chaffeensis*				
Number of Weeks /and Units Per Semester			16	32	

B - Practical Aspect: (if any)

Order	Tasks/ Experiments	Number of Weeks	contact hours	Learning Outcomes
1				
2				
3				
4				
5				
Number of Weeks /and Units Per Semester				

V. Teaching Strategies of the Course:

1-	Lectures
2-	Practical session
3-	Self leaning
4-	**Group research**

VI. Assessment Methods of the Course:

No	Assignment	
1	**Written Exams (Short Essays) and Quizzes**	a1,a2,b1,b2,c1,d1
2	Written Exams(MCQ)	a1,a2,b1,b2,c1,d1
3	Structured Oral Exams	a1,a2,b1,b2,c1,d1
4	Objective Structured Practical Exams (OSPE)	a1,a2,b1,b2,c1,d1
5	Student presentation	a1,a2,b1,b2,c1,d1

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VII. Assignments:					
No.	**Assignments**	**Week Due**	**Mark**	Proportion of Final Assessment	**Aligned CILOs (symbols)**
1	**Midterm Exam**	7	15	15%	a1,a2,b1,b2,c1,d1
2	**Activity**	Throughout the semester	5	5%	a1,a2,b1,b2,c1,d1
3	Practical Report	Throughout the semester	10	10 %	a1,a2,b1,b2,c1,d1
4	**Practical exam**	12	20	20%	a1,a2,b1,b2,c1,d1
5	**Final Exam**	14	50	50%	a1,a2,b1,b2,c1,d1
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- Warren Levinson, Peter Chin-Honh, Elizabeth A. Joyce, Jesse Nussbaum and Brian Schwartz, Review of Medical Microbiology and Immunology, 2018, 15th edition, McGraw-Hill, ISBN: 978-1-259- 64449-8

2- Jawetz, Melnick, & Adelberg's Medical Microbiology, 28e **Riedel, Stefan** Published by McGraw-Hill Education, 2019 ISBN 10: 1260012026ISBN 13: 9781260012026

2- Essential References.

1- Warren Levinson, Peter Chin-Honh, Elizabeth A. Joyce, Jesse Nussbaum and Brian Schwartz, Review of Medical Microbiology and Immunology, 2018, 15th edition, McGraw-Hill, ISBN: 978-1-259-.64449-8

Prepared by:	Reviewed by:	Head of the Department:	Vice Dean for Quality affairs	Dean of College:
Prof. Dr. Khaled A.Al-Moyed	Dr Gamil Taher Abdul Mughni	Dr Gamil Taher Abdul Mughni	Dr Gamil Taher Abdul Mughni	Ass.Pr. Dr. Ebtesam Al-Zabedi

2- Bailey & Scott's Diagnostic Microbiology 15th Edition Patricia M. Tille- February 4, 2021

3- Electronic Materials and Web Sites etc.

1- -The American Society for Microbiology (ASM) website:
http://www.asmusa.org\

2- The Centers for Disease Control and Prevention (CDC) website:
https://www.cdc.gov/

3- http://www.microbelibrary.org

4- http://www.bact.wisc.edu/Bact330/330Lecturetopics

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

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Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED

SCIENCES

Faculty of Laboratory medicine..

Department of MICROBIOLOGY & IMMUNOLOGY

Course Specification of Biomedical Statistics & Epidemiology

Course No. (03.12. 312)

2020/2021

Prepared by:	Reviewed by:	Head of the Department:	Vice Dean for Quality affairs	Dean of College:
Dr\Gamil Taher Abdul Mughni	Prof. Dr. Khalid A. AL-Moyed	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:**	Biomedical Statistics & Epidemiology			
2	**Course Code & Number:**	03.12. 312			
3	**Credit Hours:**	Theory Hours			
		Lecture	Exercise	Practical	Credit Hours
		2	1	1	3
4	**Study Level/ Semester at which this Course is offered:**	1st Level / 1st Semester			
5	**Pre –Requisite (if any):**	None			
6	**Co –Requisite (if any):**	None			
7	**Program (s) in which the Course is Offered:**	Master degree of 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. ----			
13	**Date of Approval:**				

Prepared by:	Reviewed by:	Head of the Department:	Vice Dean for Quality affairs	Dean of College:
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II. Course Description:

This course provides an advanced introduction to the statistical and epidemiological methods used in public health research. Topics include descriptive statistics, probability distributions, parameter estimation, hypothesis testing, sampling techniques, analysis of variance, and correlation. It provides basic training in statistical analysis using statistical software

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	understand the basic concepts of epidemiology and statistical reasoning to public health research	A1
B. Intellectual Skills: **Upon successful completion of the course, students will be able to:**		
b1	Identify and assess causal relationships between exposures and outcomes	B1
B2	Select and apply appropriate statistical methods to analyze data	B2
B3	Design and conduct research studies.	B3
C. Professional and Practical Skills: **Upon successful completion of the course, students will be able to:**		
c1	Interpret the results of statistical analyses	C1
c2	Use statistical software to analyze data	C4
D. Transferable Skills: **Upon successful completion of the course, students will be able to:**		
d1	Communicate the results of statistical analyses to others	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	**understand** and apply the basic concepts of epidemiology and statistical reasoning to public health research	Lecture	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	**Identify** and assess causal relationships between exposures and outcomes	Lecture	Exam
b2	**Select** and apply appropriate statistical methods to analyze data	Lecture	Exam
b3	**Design** and conduct research studies.	Lecture	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
c1	**interpret** the results of statistical analyses	Lecture	Exam
C2	Use statistical software to analyze data	Lecture	Exam

(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 the results of statistical analyses to others	Lecture	Exam

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V. Teaching Strategies of the Course:	
1-	Lectures
2-	Practical session
3-	Seminars
	Discussion

VI. Assessment Methods of the Course:

No	Assessment
1	**Written Exams (Short Essays) and Quizzes**
2	Written Exams(MCQ)
3	Structured Oral Exams
4	Objective Structured Practical Exams (OSPE)
5	Student presentation

VII. Assignments:

No.	Assessment Method	Week Due	Mark	Aligned Course Learning Outcomes	
1	**Midterm Exam**	7	20	20%	a1,b1,b2,b3,c1,c4,d1
2	**Practical exam**	12	30	30%	a1,b1,b2,b3,c1,c4,d1
3	**Final Exam**	14	50	50%	a1,b1,b2,b3,c1,c4,d1
4					a1,b1,b2,b3,c1,c4,d1
	Total		100	100%	

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X. Learning Resources:	
· *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*	
1- Required Textbook(s) (maximum two).	
1-	• Biostatistics: A Foundation for Analysis in the Health Sciences, 6th Edition by John P. Kleinbaum, Leslie L. Kupper, and Hal Morgenstern.
2-	• Epidemiology: Beyond the Basics, 2nd Edition by Moyses Szklo and F. Javier Nieto.
2- Essential References.	
1-	Maxcy-Rosenau (2010): Public health and preventive medicine, Prentice- Hall International Inc. 15th edition
2-	o Park K. (2007) eighteenth edition: Environment and Health at Park's textbook of preventive and social medicine. Ms Banarsidas Bhanot, ., India.
3-	o R. Beaglehole , R.Bonita and T Kjellström (2006): Basic Epidemiology .
3- Electronic Materials and Web Sites *etc.*	
1-	International Journal of epidemiology
2-	ECMA periodicals
3-	www. Who. Int
4-	www.cdc.org www. BMJ.com Centers for Disease Control and Prevention (.gov) https://www.cdc.gov

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