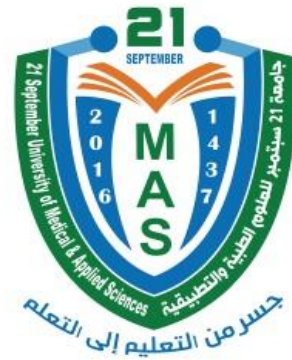




Republic of Yemen
Ministry of Higher Education & Scientific Research
21 September University for Medical & Applied Sciences



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			Credit Hours
		Lecture	Exercise	Practical	
		2	0	2	3
4	Study Level/ Semester at which this Course is offered:	1st Level / 1 st 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			

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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: <i>Upon successful completion of the course, students will be able to:</i>		
a1	Describe an in-depth of bacterial physiology, including growth, replication, and metabolism.	A1,A2
a2	Discuss the mechanisms of bacterial pathogenesis	A4
B. Intellectual Skills: <i>Upon successful completion of the course, students will be able to:</i>		
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,B4
C. Professional and Practical Skills: <i>Upon successful completion of the course, students will be able to:</i>		
c1	Identify and characterize microbial pathogens	C1,C2,C4
D. Transferable Skills: <i>Upon successful completion of the course, students will be able to:</i>		
d1	Communicate effectively through oral presentations, computer processing and presentations, and written reports.	D1,D3

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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,d3
2	Genetics and biochemistry of bacteria	Discuss the genetics and biochemistry of bacteria	1	2	a1,a2,b1,b2,c1,d1,d3
3	Mechanisms of bacterial pathogenesis	Explain the mechanisms of bacterial pathogenesis	1	2	a1,a2,b1,b2,c1,d1,d3
4	Diagnose, treatment and Prevent bacterial infections	Diagnose and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1,d3
5	Gram's- positive Cocci 1. <i>Staphylococci</i> (pyogenic cocci and coagulase-negative staphylococcus) a) Morphology, culture, and biological characteristics of <i>Staphylococcus aureus</i> b) The virulence factors of <i>Staphylococcus aureus</i>	Diagnose and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1,d3

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	and their effects (including SPA, coagulase, hemolysin, and enterotoxin) c) The diagnostic laboratory tests for <i>Staphylococcus aureus</i> and the principles of controlling Staphylococcus infections				
6	2. <i>Streptococcus</i> (classification)	diseases, virulence factors Morphology, culture, and characteristics diagnostic laboratory	1	2	a1,a2,b1,b2,c1,d1,d3
7	Gram's- negative cocci:	3.Neisseria: a) Classification of Neisseria (<i>Neisseria meningitides</i> and <i>Neisseria gonorrhoeae</i>) b) The biological characteristics and pathogenicity of - and immune response to - <i>Neisseria meningitides</i> c) Principles of diagnostic laboratory tests, and principles of prevention and treatment of the diseases caused by <i>Neisseria meningitides</i> d) <i>Neisseria gonorrhoeae</i> and	1	2	a1,a2,b1,b2,c1,d1,d3

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		infection			
8	<p>Gram-positive rods (None spore forming), Aerobic <i>Bacillus anthracis</i> <i>Bacillus cereus</i> <i>Listeria monocytogenes</i> <i>Corynebacterium diphtheriae</i> <i>Actinomycetes, norcardiosis</i> <i>and actinomycetoma</i></p>	<p>Diagnose and treat bacterial infections Prevent bacterial</p>	1	2	a1,a2,b1,b2,c1,d1,d3
9	<p>Gram-positive rods (Spore forming, anaerobes), 1. Overview: <i>Clostridia</i> , spore forming a) The main biological characteristics of <i>Clostridia</i> (<i>C. tetani</i>, <i>C. botulinum</i> and <i>C. perfringens</i>). b) Infection and Pathogenesis of <i>Clostridia</i> (tetanospasimin, and <i>Botulinum</i> toxin, toxin of <i>C. perfringens</i>) and immunity c) Diagnostic laboratory tests for the diseases cause by <i>Clostridia</i> d) Treatment and prevention of <i>Clostridia</i> diseases</p>	<p>Diagnose and treat bacterial infections Prevent bacterial</p>	1	2	a1,a2,b1,b2,c1,d1,d3
10	<p>Gram-Negative Rods Related to the Enteric Tract <i>Enterobacteriaceae</i></p> <p>pathogens both within & outside the enteric tract <i>Escherichia</i> <i>Salmonella</i></p> <p>pathogens primarily within</p>	<p>Diagnose and treat bacterial infections Prevent bacterial</p>	1	2	a1,a2,b1,b2,c1,d1,d3

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	<p>the enteric tract <i>Shigella</i> <i>Vibrio</i> <i>Campylobacter</i> <i>Helicobacter</i></p> <p>pathogens outside the enteric tract <i>Klebsiella-Enterobacter-Serratia Group</i> <i>Proteus-Providencia-Morganella Group</i> <i>Pseudomonas</i> <i>Bacteroides & Prevotella</i> <i>Fusobacterium</i></p>				
11	<p>Minor gram-positive rods Pathogens Bacteria of Minor Medical Importance <i>Abiotrophia</i> <i>Achromobacter</i> <i>Actinobacillus</i> (<i>Aggregatibacter</i>) <i>Aeromonas</i> <i>Alcaligenes</i> <i>Arachnia</i> <i>Arcanobacterium</i> <i>Arizona</i> <i>Bartonella quintana & Bartonella bacilliformis</i> <i>Bifidobacterium</i> <i>Bradyrhizobium</i> <i>Branhamella</i> <i>Burkholderia pseudomallei</i> <i>Calymmatobacterium</i> <i>Capnocytophaga</i> <i>Cardiobacterium</i> <i>Chromobacterium</i> <i>Chryseobacterium</i></p>	<p>Diagnose and treat bacterial infections Prevent bacterial</p>	1	2	a1,a2,b1,b2,c1,d1,d3

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	<p><i>Citrobacter</i> <i>Corynebacterium jeikeium</i> <i>Corynebacterium minutissimum</i> <i>Edwardsiella</i> <i>Eikenella</i> <i>Erwinia</i> <i>Erysipelothrix</i> <i>Eubacterium</i> <i>HACEK Group</i> <i>Haemophilus aegyptius</i> <i>Haemophilus ducreyi</i> <i>Hafnia</i> <i>Kingella</i> <i>Lactobacillus</i> <i>Micrococcus</i> <i>Mobiluncus</i> <i>Moraxella</i> <i>Peptococcus</i> <i>Peptostreptococcus</i> <i>Plesiomonas</i> <i>Porphyromonas</i> <i>Propionibacterium</i> <i>Rhodococcus</i> <i>Sarcina</i> <i>Spirillum</i> <i>Streptobacillus</i> <i>Streptococcus suis</i> <i>Tropheryma</i> <i>Veillonella</i> <i>Wolbachia</i></p> <p><i>Yersinia enterocolitica</i> & <i>Yersinia pseudotuberculosis</i></p>				
12	Gram-Negative Rods Related to the Respiratory Tract	Diagnose and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1,d3

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	Introduction <i>Haemophilus</i> <i>Bordetella</i> <i>Legionella</i> <i>Acinetobacter</i>				
13	Gram-Negative Rods Related to Animal Sources (Zoonotic Organisms) Introduction <i>Brucella</i> <i>Francisella</i> <i>Yersinia</i> <i>Pasteurella</i> <i>Bartonella</i>		1	2	a1,a2,b1,b2,c1,d1,d3
14	Mycobacteria Introduction <i>Mycobacterium tuberculosis</i> Atypical mycobacteria <i>Mycobacterium leprae</i>	Diagnose and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1,d3
	Spirochetes Introduction Treponema 1. <i>Treponema pallidum</i> 2. Nonvenereal <i>treponematoses</i> <i>Borrelia</i> 1. <i>Borrelia burgdorferi</i> 2. <i>Borrelia recurrentis</i> & <i>Borrelia hermsii</i> 3. <i>Borrelia miyamotoi</i> <i>Leptospira</i> <i>Other Spirochetes</i>	Diagnose and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1,d3
1	Mycoplasmas Introduction <i>Mycoplasma pneumoniae</i>	Diagnose and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1,d3
16	Chlamydiae Introduction <i>Chlamydia trachomatis</i> <i>Chlamydia pneumoniae</i>	Diagnose and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1,d3

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	<i>Chlamydia psittaci.</i>				
	Rickettsiae Introduction <i>Rickettsia rickettsii</i> & <i>Rickettsia prowazekii</i> <i>Coxiella burnetii</i> <i>Anaplasma phagocytophilum</i> <i>Ehrlichia chaffeensis</i>	Diagnose and treat bacterial infections Prevent bacterial	1	2	a1,a2,b1,b2,c1,d1,d3
Number of Weeks /and Units Per Semester			16	32	

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,d3
2	Written Exams(MCQ)	a1,a2,b1,b2,c1,d1,d3
3	Structured Oral Exams	a1,a2,b1,b2,c1,d1,d3
4	Objective Structured Practical Exams (OSPE)	a1,a2,b1,b2,c1,d1,d3
5	Student presentation	a1,a2,b1,b2,c1,d1,d3

VII. Assignments:

No.	Assignments	Week Due	Mark	Proportion of Final Assessment	Aligned CILOs (symbols)
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1	Midterm Exam	7	15	15%	a1,a2,b1,b2,c1,d1,d3
2	Activity	Throughout the semester	5	5%	a1,a2,b1,b2,c1,d1,d3
3	Practical Report	Throughout the semester	10	10 %	a1,a2,b1,b2,c1,d1,d3
4	Practical exam	12	20	20%	a1,a2,b1,b2,c1,d1,d3
5	Final Exam	14	50	50%	a1,a2,b1,b2,c1,d1,d3
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: 1260012026 ISBN 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
- 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.asmsa.org>

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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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