

**TISHK INTERNATIONAL UNIVERSITY**  
**FACULTY OF EDUCATION**  
**Department of BIOLOGY EDUCATION,**  
**2023-2024 Spring**

**Course Information for BIO 423 MEDICAL BACTERIA**

<b>Course Name:</b> MEDICAL BACTERIA						
<b>Code</b> BIO 423	<b>Regular Semester</b> 6	<b>Theoretical</b> 3	<b>Practical</b> -	<b>Credits</b> 3	<b>ECTS</b> 4	
<b>Name of Lecturer(s):</b>	Heshu Jalal					
<b>Teaching Assistant:</b>	-					
<b>Course Language:</b>	English					
<b>Course Type:</b>	Area Elective					
<b>Office Hours</b>	Thursday 12:00 pm					
<b>Contact Email:</b>	Heshu.jalal@tiu.edu.iq					
	Tel:..					
<b>Teacher's academic profile:</b>	MSc Medical microbiology BSc Medical microbiology					
<b>Course Objectives:</b>	<p>In the comprehensive Medical Bacteriology course, our primary objective is to equip students with a profound understanding of the basic principles and clinical applications of microbiology, specifically focusing on the etiological agents responsible for global infectious diseases. This rigorous course delves into the biology of bacteria and other pathogens associated with infectious diseases in humans. The overarching aim is to provide a conceptual foundation for comprehending pathogenic microorganisms and elucidate the fundamental mechanisms governing their pathogenicity. The course is structured around a diverse range of subjects, with a particular emphasis on the clinical aspects of medical bacteriology. Beginning with the foundational concepts of bacteria, students will progress to an in-depth exploration of bacterial pathogenesis, dissecting the mechanisms that underlie the development of infections. The subsequent focus areas include <i>Staphylococci</i>, <i>Streptococci</i>, and <i>Enterococci</i>, wherein students will discern the clinical significance and pathogenicity factors associated with each group. Moving forward, attention will be directed towards <i>Corynebacterium</i>, <i>Listeria</i>, <i>Bacillus</i>, and <i>Mycobacteria</i>, where the unique characteristics of these bacteria and their roles in infectious diseases will be examined. Anaerobic bacteria, such as <i>Clostridium</i> and <i>Bacteroides</i>, will be studied in relation to clinical manifestations and diagnostic challenges. The course will also cover <i>Neisseria</i>, <i>Vibrio</i>, <i>Campylobacter</i>, <i>Helicobacter</i>, and <i>Enterobacteriaceae</i>, elucidating their clinical importance and pathogenic mechanisms. Opportunistic Gram-negative bacilli, including <i>Pseudomonas</i>, will be explored with a focus on healthcare-associated infections. Additionally, zoonotic diseases such as Plague will be investigated, highlighting their etiology and impact on both human and animal populations. The course will conclude with an exploration of antibacterial agents and resistance, providing insights into the principles of antimicrobial therapy and the emergence of resistance mechanisms.</p>					
<b>Course Description (Course overview):</b>	<p>This course provides learning opportunities in the basic principles of medical bacteriology and infectious disease. It covers systemic pathogenic bacteria including <i>gas gangrene</i>, <i>tuberculosis</i>, <i>mycoplasma</i> and <i>chlamidial</i> diseases of human and also their mechanisms of infectious disease, transmission, principles of aseptic practice, and the role of the human body's normal microflora. Relevant clinical examples are provided. It also provides opportunities to develop informatics and diagnostic skills, including the use and interpretation of laboratory tests in the diagnosis of infectious diseases.</p>					

**COURSE CONTENT**

Week	Hour	Date	Topic
1	3	28/1-1/2/2024	Holiday
2	3	4-8/2/2024	Bacteria-Basic concepts
3	3	11-15/2/2024	Pathogenesis of bacterial infections
4	3	18-22/2/2024	<i>Staphylococci</i>
5	3	25-29/2/2024	<i>Streptococci</i>
6	3	3-7/3/2024	<i>Corynebacteria</i>

7	3	24-28/3/2024	Mycobacteria
8	3	31/3-4/4/2024	Holiday
9	3	14-18/4/2024	Midterm Exam
10	3	21-25/4/2024	Midterm Exam
11	3	28/4-2/5/2024	Clostridium and other anaerobes
12	3	5-9/5/2024	Pseudomonas
13	3	12-16/5/2024	Vibrio Cholera
14	3	19-23/5/2024	H.Pylori
15	3	26-30/5/2024	Antibacterial Agents and Resistance
16	3	2-6/6/2024	Final Exam

#### COURSE/STUDENT LEARNING OUTCOMES

- 1 Demonstrate a thorough knowledge of the fundamental concepts related to the structure, physiology, and an appreciation of their diversity in morphology.
- 2 Analyze and evaluate the general mechanisms underlying bacterial pathogenesis, showcasing an understanding of host-pathogen interactions and factors influencing the outcomes of infections.
- 3 Differentiate between major bacterial groups such as Staphylococci, Streptococci, Enterococci, Mycobacteria, and others, with a focus on their clinical significance and pathogenicity factors.
- 4 Understand the clinical importance and epidemiology of bacterial infections caused by diverse pathogens, including anaerobes, Neisseria, Vibrio, Campylobacter, Enterobacteriaceae, Pseudomonas, and zoonotic agents.
- 5 Explore the principles of antimicrobial therapy, mechanisms of action of antibacterial agents, and the emergence of antibacterial resistance, emphasizing the implications for clinical practice.

#### COURSE'S CONTRIBUTION TO PROGRAM OUTCOMES

(Blank : no contribution, I: Introduction, P: Proficient, A: Advanced )

Program Learning Outcomes		Cont.
1	Write accurately and clearly about biology topics that conform to the scientific conventions of that field.	P
2	Describe the molecular components of living things, their heredity transformations and the main concerns in these biological process	P
3	Identify and analyze the microorganisms including bacteria, fungi and virus and their roles in nature.	A
4	Characterize the features of plant organs/tissues/cells/organelles involved in cellular respiration, photosynthesis, reproduction and growth.	
5	Describe the micro and macro anatomy of the living systems and recognize the relationship between structure and function at all biological systems and levels.	P
6	Apply safety and proper techniques in the laboratory, and report the results of conducted experiments.	
7	Use appropriate methods and techniques to improve their students' critical thinking, creative thinking and problem-solving skills.	I
8	Effectively organize and manage classrooms.	
9	Use required methods and techniques for student-centered teaching by considering individual and cultural differences of students.	
10	Develop research studies that applies quantitative or qualitative research methods that address research questions in the field.	P

<b>Prerequisites (Course Reading List and References):</b>	student must have taken a course of basic biology, Microbiology as a prerequisite, an understanding of medical immunology, molecular biology.: *Sherris Medical Microbiology: An Introduction to Infectious Diseases
--	--

<b>Student's obligation (Special Requirements):</b>	1. Students are expected to actively engage in class discussions, case studies, and interactive sessions to enhance their understanding of medical bacteriology concepts. 2. Students are required to complete assigned readings, review relevant course materials, and prepare for discussions to actively contribute to the learning environment. 3. Completion of assignments, quizzes, and examinations is mandatory. These assessments are designed to evaluate students' comprehension of the course content and their ability to apply
---	---

	knowledge. Students are expected to adhere to a high standard of professional conduct, including respectful communication with instructors and peers, maintaining academic integrity, and complying with ethical standards in research and case discussions.
<b>Course Book/Textbook:</b>	1. Kenneth J. Ryan, editor. Sherris Medical Microbiology : an Introduction to Infectious Diseases. Norwalk, Conn. :Appleton & Lange, 7th edition. 2. Jawetz, Melnick & Adelberg's Medical Microbiology by Geo. F. Brooks, Karen C. Carroll, and Janet S. Butel 3. Prescott's Microbiology by Joanne Willey, Linda Sherwood, and Christopher J. Woolverton
<b>Other Course Materials/References:</b>	1. Medical Bacteriology: A Practical Approach (Practical Approach Series), 2004 by Peter Hawkey and Deirdre Lewis - Jawetz Melnick & Adelbergs 2. Medical Microbiology 27 E (Lange),2015 by Karen C. Carroll and Janet S. Butel 3. 3- Medical Microbiology: 7e, 2012 by Patrick R. Murray PhD and Ken S. Rosenthal PhD
<b>Teaching Methods (Forms of Teaching):</b>	Lectures, Presentation, Assignments, Case studies, , ,

**COURSE EVALUATION CRITERIA**

<b>Method</b>	<b>Quantity</b>	<b>Percentage (%)</b>
Quiz	3	5
Homework	2	5
Midterm Exam	1	25
Presentation	1	10
Final Exam	1	40
<b>Total</b>		<b>100</b>

**Examinations:** Essay Questions, True-False, Fill in the Blanks, Multiple Choices, Short Answers, Matching, , ,

**Extra Notes:**

<b>ECTS (ALLOCATED BASED ON STUDENT) WORKLOAD</b>			
<b>Activities</b>	<b>Quantity</b>	<b>Workload Hours for 1 quantity*</b>	<b>Total Workload</b>
Theoretical Hours	16	3	48
Practical Hours	16	0	0
Final Exam	1	20	20
Quiz	3	3	9
Homework	2	4	8
Midterm Exam	1	5	5
Presentation	1	20	20
<b>Total Workload</b>			<b>110</b>
<b>ECTS Credit (Total workload/25)</b>			<b>4</b>

**Peer review**

Signature:	Signature:	Signature:
Name:	Name:	Name:
Lecturer	Head of Department	Dean