Module (Course Syllabus) Catalogue

2022-2023

College/ Institute	Erbil Health Technic College	
Department	MLT	
Module Name	Medical Microbiology	
Module Code	MMB305	
Degree	Bachler ☒	
Semester	3	
Qualification	Ph D Medical Microbiology	
Scientific Title	Assistant professor	
ECTS (Credits)	6	
Module type	Prerequisite ☐ Core ☒ Assist. ☐	
Weekly hours (Theory)	2 hrs class	(30)Total hrs Workload
Weekly hours (Practical)	2hrs class	(30)Total hrs Workload
Number of Weeks	15	
Lecturer (Theory)	Assist. Prof. Dr. Sazan Moffaq Abdulaziz	
E-Mail & Mobile NO.	Sazan.abdulaziz@epu.edu.iq	
Lecturer (Practical)	Lecturer. Chiman Hameed Saeed	
E-Mail & Mobile NO.	chiman.saeed@epu.edu.iq/ 07504583555	
Websites		

Course Book

<table>
<tr><td>Course Description</td><td>This is a general medical microbiology course intended for students of the department of Medical Laboratory Technics.
The structure of the course is based on presenting the fundamentals of microbiology to include structures, morphology and classification of bacteria, viruses, fungi and parasites. The students will be introduced to the pathogenesis of the various infectious agents. The course will also cover some topics related to community health, including the modes and sources of infection. Aspects like lab diagnosis and antimicrobial agents will also be included.</td></tr>
<tr><td>Course objectives</td><td>1. Understanding the composition of the microbial world, classification and their importance in our life.
2. Understanding the structure of the microbial groups; bacteria, fungi, viruses and protozoa, highlighting the differences among them.
3. Understanding microbial pathogenesis focusing on the role of different microbial virulence factors in disease initiation and progression.
4. Understanding important aspects on antimicrobial agents.
5. Understanding important aspects on different lab technics used in microbial diagnosis.
6. Realizing the importance of safety standards and the aseptic techniques in preventing and controlling diseases in microbiology labs.
7. Basic requirements of a microbiology laboratory
8. Identify bacterial cell structure.
9.Definition, classification, habitats and morphology
10.The methods for preparing culture for microorganism
11.Type of media use in the lab.
12.Inoculation of culture medium.
13.Susceptibility to antimicrobials.
14.Using different dyes for identification of microorganisms.
15.Flagella, capsule and endospore stain, bacterial motility</td></tr>
<tr><td>Student's obligation</td><td>The role of students and their obligations throughout the academic year are:
1. Preparing for class (attendance, quizzes, reports and exams &other activity)
2. Willing to work hard to complete course activities.
3. Willing to bring their life experiences into the class to enrich discussions.
4. Demonstrate an ability to work in group settings and exchange ideas concerning course-related topics. Read, write, and speak about Microbiology with classmates and members of the community.</td></tr>
<tr><td>Required Learning Materials</td><td>Laboratory practice: equipment and materials</td></tr>
<tr><td>Evaluation</td><td>
<table>
<tr><th colspan="2">Task</th><th>Weight (Marks)</th><th>Due Week</th><th>Relevant Learning Outcome</th></tr>
<tr><td colspan="2">Paper Review</td><td></td><td></td><td></td></tr>
<tr><td rowspan="2">Assign me</td><td>Homework</td><td>5%</td><td></td><td></td></tr>
<tr><td>Class Activity</td><td>2%</td><td></td><td></td></tr>
</table>
</td></tr>
</table>

		Report	5%		
		Seminar	5%		
	Quiz		8%		
	Lab reports		10%		
	Midterm Exam		25		
	Final Exam		40		
	Total		100		

Specific learning outcome:

By the end of the course, the students are being able to:

1- Develop basic academic knowledge about the concepts and principles of Medical Microbiology.

2- Cover the importance of Microbiology and the history background of this subject and its importance in individual's life.

3- Understand basic knowledge about the role and mechanism used by different microorganisms in disease production

4- Learn basic knowledge on infection control procedures

5- Learn practically the technique of examining, using, how to collect the different type of specimens and how to prepare it for examinations and be familiar with the results and writing reports.

7- Perform simple and differential stains on isolates and properly use compound light microscopes to visualize and describe microbial cell morphologies.

8-Methods for identification of microorganism using morphological and biochemical tests.

9-Demonstrate basic laboratory skills.

10-Describe the laboratory diagnosis and recognize how to isolate bacteria.

11-Laboratory exercises develop fundamental skills in aseptic technique, microscopy, pure culture study, and the isolation and identification of pathogenic microorganisms. Students working "hands-on" in the labs develop an understanding of the microbiological elements necessary for the diagnosis of infectious diseases. The students participate in an active, small-group learning experience, recalling concepts and information

12- In addition, they will be greatly able to work in teams and their presentation skills will be markedly progressed.

Course References:

1. Ryan K.J. (2017). *Sherris Medical Microbiology, 7e*. McGraw Hill. https://accessmedicine.mhmedical.com/content.aspx?bookid=2268&sectionid=176081144

2.Riedel S., & Hobden J.A., & Miller S, & Morse S.A., & Mietzner T.A., & Detrick B, & Mitchell T.G., & Sakanari J.A., & Hotez P, & Mejia R. (2019). *Jawetz, Melnick, & Adelberg's Medical Microbiology, 28e*. McGraw Hill. https://accessmedicine.mhmedical.com/content.aspx?bookid=2629&sectionid=217768734

3.Varghese N & Joy P. P. (2014). Microbiology Laboratory Manual. Vazhakulam. https://www.researchgate.net/publication/306018042_Microbiology_Laboratory_Manual

4. Kamel,F. And Jarjes,S. (2015). Essentials of Bacteriology and Immunology.

5. Greenwood,D.;Slack,R.;Peutherer,J.andBarer,M.(2007).Medical Microbiology, 17th ed.,Elsevier.

6.Jawetz,E.,Melnick,J.L.andAdelberg,E.A.(2007).MedicalMicrobiology,24th ed., Mc Graw Hill Medical.

	4. Gupte, S. (2006). The short textbook of medical microbiology,9th ed.,Jaypee. 5- Microbiology (Principle and Exploration) Jacquelyn G. Black- 5th edition 6-Microbiology Experiments (edition) A health Science perspective John Kleyn- Mary Bicknell

Course topics (Theory)	Week	Learning Outcome
Introduction to Microbiology Eukaryotic cell and Prokaryotic cell	1	Understanding of basic medical microbiology
Bacterial Cell Structure and classification	2	Understanding bacterial cell structure and classification
Viruses and prions, replication of viruses	3	Understanding virus structure, classification and replication
Fungal and protozoal structure and classification	4	Understanding Fungal and protozoal structure and classification
Bacterial Growth and factors that determine growth	5	Explaining bacterial growth cycle and the essential nutrients required for bacterial growth
Bacterial genetics	6	Describing the genetic material of bacteria and its clinical implication
Pathogenesis of bacterial diseases	7	Understanding the pathogenic role of bacteria and their virulence factors
Pathogenesis of viral diseases	8	Understanding the pathogenic role of viruses and their virulence factors
Antimicrobial drugs 1	9	Susceptibility to antimicrobials and explain the mechanism of action and rational use of antimicrobials mechanisms of resistance
Antimicrobial drugs 2		Susceptibility to antimicrobials and explain the mechanism of action and rational use of antimicrobials mechanisms of resistance
Diagnosis of bacterial and fungal diseases	11	Types of mechanism of antimicrobial drugs resistance
Diagnosis of viral diseases	12	How many types of specimen and methods of Collection, Transport
Practical Topics	**Week**	**Learning Outcome**
Safety Rules in Lab. Practices	1	**The safety standard in the microbiology lab.**
Basic requirements of a microbiology laboratory	2	**Basic requirements and tools in the microbiology laboratory**
Sterilization and Disinfection	3	**Physical (Heat and filtration) sterilization**
Sterilization and Disinfection	4	**Chemical sterilization and disinfection**
Bacterial culture media and methods for preparation	5	**Type of culture media used in microbiology lab and their methods for preparation**
Inoculation of culture media and incubation	6	**Methods of Inoculation of culture media and Selection of suitable incubation condition for each specimen**
Systems of identification of microorganisms - **Smear preparation & Simple Staining and negative staining**	7	**Perform smear preparation and simple staining on isolates and properly use compound light microscopes to visualize and describe microbial cell morphologies.**

- **Differential Stain / Gram stain**	8	**Perform differential stains on isolates and properly use compound light microscopes to visualize and describe microbial cell morphologies.**
- **Differential stain- Acid fast stain**	9	**Perform differential stains on isolates and properly use compound light microscopes to visualize and describe microbial cell morphologies.**
- **Special stain (Flagella, capsule and endospore stain and bacterial motility**	10	**Perform specific stains on isolates and properly use compound light microscopes to visualize and describe microbial cell morphologies.**
-Effect of Temperature, PH and Salt on Microbial Growth	11	**Shows the effects of temperature, PH and salt on microbial growth practically.**
-Biochemical tests	12	**Identification of microorganisms based on biochemical reaction**