



**Department of Medical Laboratory Analysis**  
**College of Health Sciences**  
**University of Cihan- Sulaymaniyah**

**Subject: Introduction to Microbiology**

**2<sup>nd</sup> Stage - 1<sup>st</sup> semester**

**Course Book – Year 2023-2024.**

**Lecturer's name: Avin Salih Sidiq**

**Karokh Ali Khdir**

**Academic Year: 2023/2024**

# Course Book

<b>1. Course name</b>	<b>Introduction to Microbiology</b>
<b>2. Lecturer in charge</b>	<b>Avin Salih Sidiq Karokh Ali Khdir</b>
<b>3. Department/ College</b>	<b>Medical Laboratory Analysis</b>
<b>4. Time (in hours) per week</b>	<b>6 Hrs Theory 12 Hrs Practical</b>
<b>5. Office hours</b>	<b>All days of the week from 9:00 to 14:00</b>
<b>6. Course code</b>	
<b>7. Teacher's academic profile</b>	<a href="https://uni.sulicihan.edu.krd/qa/profile.php?id=13">https://uni.sulicihan.edu.krd/qa/profile.php?id=13</a>
<b>8. Keywords</b>	<b>Microorganism, Microbial Growth Control, Microbial Identification.</b>
<b>9. Course overview:</b>  <p>The Microbiology course consist of theory and practical sessions, it is prepared to direct MLA students to acquire an in-depth knowledge and strategies in General Microbiology. It is an exciting time for students, and offers unique experiences in the medical laboratory setting. For the practical side we will focus on several exercises on the basic concepts of microbiology and assists students to get necessary knowledge, skills, and practice in this field. In addition, students will learn how to work safely in microbiology labs. Each exercise composed of a short background about a specific topic followed by the principle, aims, required materials, and procedures needed to perform that exercise.</p>	
<b>10. Course objective:</b>  <p>The aim of Microbiology course is to familiarize undergraduate students with the principle of microbiology, with an emphasis on microbial structure, function, growth and their physiology as well as basic principles and application relevance of clinical disease for students who are in preparation as technicians in diagnostic microbiology lab. The course also concentrates on the diversity and activity of microorganisms in their natural environment, their mutual interactions and their survival adaptation strategies. The overarching goals for the laboratory portion of this course are to teach microbiological techniques and to show students the impact of microbes on our daily lives and their central roles in nature as well as aseptic and sterile techniques.</p>	

## 11. Student's obligation

A student has an obligation to respect the ethical standards of **Cihan University** in the following points:

### A. Class Attendance and responsibilities:

1. Students are expected to attend each class for the entire semester.
2. If a student arrives more than 15 minutes late or leaves more than 15 minutes early, they will be marked as absent for the whole hour.
3. Students are responsible for material present in lectures.
4. Students will take several quizzes over the course and the quiz marks will be counted toward the final grade. So, try to prepare yourself for quiz every week.

### B. Penalty and acceptable excuses for class and exam absence:

5. Only students with official absence, family crises, and illness are excused from class.
6. Three occasions of lateness count as one absence.
7. The student who misses 10 percent of the classes will be placed on probation.
8. Since all examinations are announced in advance, **ZERO** grade will be given to any missed examination unless a student has an acceptable reason, such as illness, for not being able to take the examination during all those days when the examination was announced.

## 12. Forms of teaching

The way in which teaching is structured is in the form of lectures and laboratory exercises. Compulsory parts of the course include quizzes and final account. The lectures are added more detail through assignments, cooperative learning, videos and web tools.

## 13. Assessment scheme

Theory Session			
No.	Activities	Number or Quantity	Mark %
1	Assignments/ Home Work	2-3	2
2	Quiz	4-5	4
3	Daily Activity	-	2
4	Attendance	-	2
5	Test (Theory)	1	20
<b>Total</b>			<b>30</b>

### Practical Session

1	Quiz	4-5	4
2	Lab. Report	-	8
3	Lab. Presentation	-	4
4	Lab. Attitude	-	2
5	Attendance	-	2
<b>Total</b>			<b>20</b>
<b>Final Exam</b>			
1	<b>Practical Examination</b>	1	20
2	<b>Theory Examination</b>	1	30
<b>Total</b>			<b>100</b>

#### 14. Student learning outcome:

The overall goal of this course is for the student to gain a basic knowledge on Microbiology. After participating in the course, students would achieve an understanding of the following:

The students will learn:

1. History and importance of microbiology
2. Measures or techniques to control microbial growth [Physical and chemical methods]
3. Culturing Microorganisms [Culture medium, sterile conditions, evaluation of growth]
4. Microbial genetics, genomes, DNA, RNA, Replication, transcription, and translation.

#### 15. Course Reading List and References:

- a. Brown, A., & Smith, H. (2015). *Benson's Microbiological Applications: Laboratory Manual in General Microbiology* (Thirteenth E). McGraw-Hill Education,.
- b. Gwendolyn R. W. Burton, & Paul G. Engelkirk. (2003). *Microbiology for the Health Sciences* (Seventh Ed). Jones & Bartlett Learning
- c. Cappuccino, J. G., & Welsh, C. (2017). *Microbiology, A Laboratory Manual* (Eleventh E). Pearson Education

## 16. The Topics:

### A. Theory Lecture

no.	Topic
1	Introduction to Microbiology: Historical Backgrounds
2	Microbial Taxonomy and nomenclature
3	Structure and Function of Prokaryotic Cell
4	Microbial Growth and Physiology I
5	Microbial Growth and Physiology II
6	Microbial Genetics
7	Principle of Disease and Epidemiology
8	<b>Midterm exam</b>
9	Gram-positive Cocci
10	Introduction to Virology
11	Introduction to Mycology
12	Introduction to Parasitology
13	<b>Final Examination</b>

### B. Practical Lecture

no.	Topic
1	Introduction, laboratory safety and course syllabus
2	Microbiological laboratory equipment and & microbial growth control methods
3	Culture Media, preparation, and their physical, chemical and functional types
4	Microbial growth requirements & isolation techniques
5	Culture characteristic of microbes (colony morphology, texture and topography)

6	Microscopic characteristics, smear preparation & simple staining
7	Differential staining (Gram staining technique)
8	Differential staining (Acid-fast staining (Ziehl–Neelsen stain) & spore staining)
9	Microbial counting methods (viable or standard plate count, direct microscopic count & spectrophotometric method)
10	Enzymatic activities of bacteria (catalase, coagulase, oxidase & urease)
11	IMViC tests (Indole test, Methyl Red test, Voges Proskauer test and Citrate utilization test)
12	Antimicrobial agents, Antibiotics & antimicrobial sensitivity assays (disk diffusion method, well diffusion method & broth microdilution method)
13	<b>Final Examination</b>

## 17. Sample of Question:

**Q1/ Define the following terms:**

- 1) Sex Pili      2) Slime layer

**Q2/ Determine if the following statements are true or false. If false, replace the underlined word(s) or expression to produce a true statement.**

- 1) Encapsulated bacteria usually produce colonies on nutrient agar that are smooth, mucoid, and glistening; they are referred to as R-colonies.
- 2) When a pathogen colonizes a person's body and cause a disease, the disease known as infectious disease.

**Q3/ Fills the blanks with the correct answer:**

- 1) The movement of bacteria in response to light known as .....
- 2) Most pathogenic microorganism belong to ..... group based on P<sup>H</sup> range.

**Q4/ Answer the following:**

- 1) What is plasmid? Describe its role and importance in bacteria.
- 2) Describe the application of microbe in the following:

A) Microbes-Elemental cycles.

B) Microbes-Biotechnology.

**18. Peer review:** I certify that:

1. I read and verify all requirements of teaching quality assurance are respected in this course book.
2. The scientific contents are new, convenient and well organized for this stage.
3. The order of chapters is well done.
4. References are new and available for students.

That's why I signed on this course book and I take all responsibilities.

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Date: 6/ 09/ 2024

Signature:

**Main Lecturer in charged**  
**Avin Salih Sidiq**

**Head of The Department**  
**Dr. Hastyar Hamarashid**