**Department of Plant Protection**

**College of Agricultural Engineering Sciences**

**Salahaddin University-Erbil**

**Subject: Microbiology**

**Course Book –Year 2**

**Lecturer's name: Assist. Prof. Dr. Ramadan Yousif Mohamed**

**Practical Lecturer's name: Mohamed Yousif Mohamed**

# Academic Year: 2022/2023

# Course Book

| | |
|---|---|
| **1. Course name** | Forest diseases |
| **2. Lecturer in charge** | Assist.Prof.Dr. Ramadan Yousif Mohamed<br>Practical Lecturer's name: Mohamed Yousif Mohamed |
| **3. Department/ College** | Plant Protection Dept./Agricultural Engineering Sciences College. |
| **4. Contact** | e-mail: ramadan.mohamed@su.edu.krd<br>Tel: +964 (0) 750 449 2938<br>e-mail: muhammed.m.salih@su.edu.krd<br>Tel: 07504528076 |
| **5. Time (in hours) per week** | Theory: 2<br>Practical: 3 |
| **6. Office hours** | 8:30 – 2:00 from Sunday to Thursday |
| **7. Course code** | |
| **8. Teacher's academic profile** | Doctor of philosophy (PhD) in Biology, plant pathology, graduated in the university of Mosul, Iraq 2012. Thesis title: Genetic Transformation in Chickpea by *Agrobacterium rhizogenes* R1601 and Protoplast Fusion for Resistance to Fusarium and Ascochyta. Supervised by: Assist. Prof. Dr. Nadeem Ahmed Ramadan. My master degree (MSc) in biology, plant pathology, graduated in the university of Mosul, Iraq 2006. Thesis title: Study of powdery mildew diseases in fields of provinces of northern. Supervised by: Assist. Prof. Dr. Nadeem Ahmed Ramadan. my Bachelor degree (BSc) in Biology /College of Science /University of Mosul/Iraq 1989-1990. |
| **9. Keywords** | **Microbiology/Prokaryotic , Eukaryotic ,Bacteria ,Fungi** |

**10. Course overview:**

Microbiology is a broad discipline that involves the study of the biology of bacteria, viruses, protozoa and fungi.

The main focus of our course is bacteria. This course will provide a conceptual and experimental background in microbiology sufficient to enable students to take more advanced courses in related fields, in addition, take benefit in careers in allied health and nursing or as advisors if they work as science teachers in schools. We also cover aspects of the biochemistry, physiology and genetics of microorganisms.

This course provides an introduction to the field of Microbiology, properties of microorganisms, bacterial structure, their shape, classification, nutrition, growth, cultivation. How to control their effect. Their important in biotechnology field.

**11. Course objective:**

The primary goals of this course are:

• To have graduates with high knowledge in this field.

• Describe the historical perspectives important in the development of microbiology and

the current diversity in the field to include the germ theory and the microbes being studied.

• To give an idea about the main role of microorganisms in nature and the life.

• Compare and contrast eukaryotic and prokaryotic cells and their specific structures with functions.

• Encourage skills that make the student a lifelong learner to understand concepts such as cell structure, physiology, disinfection, drug actions, genetics, pathogenesis, transmission of diseases.

• Explain principles of physical and chemical methods used in the control of microorganisms and apply this understanding to the prevention and control of infectious diseases.

**12. Student's obligation**

Students are required to conduct one writing test theoretical and two tests in practical lectures, each exam will be on 100 degree then it will transferred to 15 degrees, 10 on writing test , 5 for conservation and participating in lectures, while 35 degrees for practical lectures. The final exam will be on 50 degrees just in theoretical.

## 13. Forms of teaching

1. Power point presentations by using data show to show outlines of lectures.
2. White board.

## 14. Assessment scheme

| Time | Theoretical | Practical |
|---|---|---|
| During semester | **10** | **30** |
| Participation conservation and activity | **5** | **5** |
| Final exam. | **50** | **0** |

## 15. Student learning outcome:

Upon completion of the course, students should be able:

1. To demonstrate the ubiquity and diversity of microorganisms in the human body and the environment.
2. To illustrate the characteristics features of microorganisms (bacteria) and the diseases they cause.
3. To explore mechanisms by which microorganisms (bacteria) cause disease.
4. To show the antimicrobial activity of disinfectants in the context of the patient and the environment.
5. To illustrate the microbiological reasons for, and the importance of aseptic techniques patient management.
6 . To demonstrate the contribution of the microbiologist and the microbiology laboratory

to the diagnosis of infection including specimen collection and the role of the nurse in carrying this out

## 16. Course Reading List and References:

Textbooks:

- Prescott's Principles of Microbiology by J Willey, Sherwood and Woolverton.
- Foundations in Microbiology by Talaro and Chess.
- Microbiology: An Introduction, by Totora, Funke and Case.
- Jawetz, Melnick & Adelberg's Medical Microbiology, by Brooks, Butel and Morse.
- The microbiolog by Dr. Schaechter's "Small Things Considered": http://schaechter.asmblog.org/schaechter/
- Todar's Online Textbook of Bacteriology: http://www.textbookofbacteriology.net/

## 17. The Topics: | Lecturer's name

| Week No. | Subject |
|---|---|
| 1st | Coarse book |
| 2nd | Definition of Microbiology. |
| 3rd | Microorganisms |
| 4th | Prokaryotes and Eukaryotes: The important differences. |
| 5th | Bacteria and structure of it |
| 6th | Bacteria growth |
| 7th | Shape of bacteria |
| 8th | Media for growth of bacteria |
| 9th | Types of bacteria |
| 10th | Virulence factor of bacteria |
| 11th | Antibiotics |
| 12th | Defence of bacteria against of antibiotics |
| 13th | Reproduction in bacteria |
| 14th | Sporeforming |
| 15th | Bacterial Nutrition |

**Dr.Ramadan Y.M.(2hrs)**

## 18. Practical Topics (If there is any)

In this section The lecturer shall write titles of all practical topics he/she is going to give during the term. This also includes a brief description of the objectives of each topic, date and time of the

Week and Subject Title

1. Labrotary saftey instrictions
2. The names and uses of the various laboratory tools
3. Sterilization principle and methods
4. Culture media and media preparation

Lecturer's name:
Miss. Mohamed Yousif
(3 hrs)

5. Cultivation of bacteria
6. Colony characteristics
7. Pure culture technique
8. Used of microscope
9. Bacteria cell shapes, size and arrangments
10. Motility demonstration
11. Smear preparation and simple stain
12. Staining technique: Gram stain
13. Capsule staining
14. Endospore Staining
15. Effect of antibiotics
16. Microbiological examination of water
17. Bacterial examination of air
18. Bacterial examination of soil

## 19. Examinations:

***1. Compositional:*** In this type of exam the questions usually starts with Explain how, What are the reasons for…?, Why…?, How….?
With their typical answers
Examples should be provided
Q/What are the reasons foraddition of agar in solid media instead of gel?Why?How?
Answer:agar is melted in 98°c and sets at 42°c. because agar used for preparing solid medium. 2% agar is employed in solid medium.

***2.True or false type of exams:***

In this type of exam a short sentence about a specific subject will be provided, and then students will comment on the trueness or falseness of this particular sentence. Examples should be provided

Q/A bacterial colony is a bacterial population derived from different bacterial cell.

Answer: false. from one cell.

***3. Multiple choices:***
In this type of exam there will be a number of phrases next or below a statement, students will match the correct phrase.Examples should be provided.
Q/Aculture contain more than one type of colony.(**mixed culture**, pure culture).

## 20. Extra notes:

- When an exam deferred by a student, whatever be the reason, he/she has to inform the lecturer in order to reschedule for the exam within one week from deferral otherwise he/she has no right to claim and zero will be given.

## 21. Peer review پێداچوونەوەی هاوەڵ

This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book

by writing few sentences in this section.