



University of Salahaddin

College of Science

Department of Biology (General Biology)

Subject: General Microbiology Course Book

Stage: Second Stage

Lecturer's name:

1- Dr. Dimen Aula Aumer

2- Lecturer Musa Ibrahim Taha

Academic Year: 2022-2023(part I and II)

Course Book

1. Course name	General Microbiology
2. Lecturer in charge	Dr. Dimen Aula Aumer
3. Department/ College	Biology/ Science
4. Contact	e-mail: dimen.aumer@su.edu.krd
5. Time (in hours) per week	2hr./week
6. Office hours	To be return to the schedule on the office door
7. Teacher's academic profile (Dr. Dimen Aula Aumer)	<p>I graduated from Salahaddin University in 2000(Ranked 2nd in college) worked as assistant biology for three years.</p> <p>In 2006 I got my MSc degree in Microbiology and start as Assistant Lecturer Teaching Practical General Microbiology.</p> <p>In 2015 I got my PhD degree in molecular Bacteriology, as a Lecturer, I am in charge in teaching microbiology theory for 2nd class students, supervising microbiology Practical Laboratory, supervising two 4th year students for their research projects.</p>
8. Keywords	Microbiology, Bacteria, Viruses, Bacterial Cell wall.....etc.

9. Course objective:

This systematic subject prepared to teach second stage biology students through in one year study. The subject will cover the study of the microbial science and its applications in the laboratory. Microbial world comprises microscopic algae, fungi, bacteria, viruses and protozoa. We are living in the age of microbiology. Almost daily come reports of new discoveries in the exciting science-new emerging infections, new organisms, and new tools to facilitate discovery. Microorganisms are the oldest, the most numerous, and the most diversified form of life on earth. They shape our environment, decompose dead animal and plant matter, and keep our soil fertile. In the past and current century alone, owing in large part to the application of discoveries in microbiology, our life expectancy has been increased by approximately 50 percent. Because of microbiology we know how to protect ourselves from diseases, how to preserve our food better and we eat and live in cleaner, better houses under more sanitary conditions. Due in part to advances in microbiology, the people living in the twenty first century, are the brightest, and best looking generation ever to inhabit this planet.

Student's obligation:

***Exam policy:**

The students should take 2 exams during the course, there will be no make-up exams for absences students without a medical reports.

***Classroom policies:**

1- Attendance: You are strongly encouraged to attend class regularly, as participation is important to your understanding of the material. This is your opportunity to ask questions. You are responsible for obtaining any information you miss due to absence.

2-Lateness: Lateness to class can disrupt the flow of a lecture-discussion.

3-Electronic devices: All cell phones are to be turned off at the beginning of class and put away during the entire class.

4-Talking: During class please refrain from side conversations. These can be disruptive to your fellow students and your professor.

5- No Disrespectful to both the lecturer and to your fellow students.

Forms of teaching:

Face-to-Face (Lectures and PowerPoint)

References:

Talaro, A., Talaro, A. (2018) Foundations in Microbiology, basic principles. 10th ed.,
W.M.C. Brown publishers.

*Nester, E.W., Anderson, D.G., et al (2021) Microbiology: a human perspective, 10th ed. the
McGraw-Hill companies.

* Tortora, G.J., Funke, B.R. and Case, C.L. (2019) Microbiology an introduction. 13th ed.,
Pearson Education.

The Topics: 2 hr./week

Week 1: Welcome to microbiology, course outlines, reference books that depended on, and
the rules of studying basic Microbiology.

Week 2: The Scope of Microbiology

Week 3: Types of Microorganisms

Week 4: A Brief History of Microbiology

Week 5: The Golden Ages of Microbiology

Week 6: The Prokaryotic Cell, size, shape and arrangement of bacterial cells

Week 7: The structure of a typical prokaryotic cell

Week 8: Archaea, axial filaments, fimbriae, and pili

Week 9: The Cell Wall

Week 10: Structures Internal to the Cell Wall

Week 11: Structures in the Cytoplasm of Prokaryotes

Week 12: Microbial growth

Week 13: Physical Requirements for Microbial Growth

Week 14: Chemical Requirements for Microbial Growth

Week 15: Growth of Bacterial Culture

Week 16: Control of Microbial Growth

Week 17: Physical Methods of Microbial Control

Week 18: Chemical Methods of Microbial Control

Week 19: Antimicrobial drugs

Week 20: Antimicrobial drug resistance

Week 21: Viruses and other Acellular Agents

Week 22: Fungi

Week 23: Microbial Nutrition

Week 24: Water Microbiology

Week 25: Soil Microbiology

**Department of ...Biology / ((General Biology
)) 2nd stage ((General Biology))**

College ofScience.....

University ofSalahaddin.....

Subject: Practical General

Microbiology/Part I and II.

Course Book – Year 2

Lecturer's name:-Lecturer Musa Ibrahim Taha

Academic Year: 2022-2023 PartI and Part II

Course Book

1. Course name	General Microbiology
2. Lecturer in charge	Lecturer Musa Ibrahim Taha
3. Department/ College	Biology/Science
4. Contact	e-mail: Musa.taha@su.edu.krd Tel: (optional)
5. Time (in hours) per week	Practical: 6 hrs/week
6. Office hours	20 hours
7. Course code	
8. Teacher's academic profile	<p>Lecture :-Musa Ibrahim Taha</p> <p>In 1984-1985 I awarded B.Sc, in Microbiology from Salahaddin university College of Science (Ranked 6 in College).In 1989 I awarded M.sc., in Biology / (biological control of fungi) from the same college.</p> <p>In 1989 I was assigned in Erbil Technical Institute as assistant lecturer. I have taught different lectures in all of the medical departments of the institute which were(Clinical physiology, Medical Microbiology).I was the directorate of Scientific directorate of Erbil Technical Institute for 8 years and I was head of Nursing department in Erbil Technical Institute for 8 years. In 2005 I moved to college of Science Biology Dept. and I taught Mycology for 3rd year students of biology, General biology for 1st year of Geology dept. Ecology dept, Ecophysiology for 4th year biology and now I teach (practical Mycology for 3rd year biology)I have been teaching 30 years ,I worked in different Scientific and administrative committees in Erbil Technical Institute and College of Science.</p> <p>List of my publication:- -----</p> <p>1-Musa I.Taha (1989) Biological Control of Root Rot Disease of Broad bean.3rd International conf. of pests and Arab countries. Ismailia, Egypt.</p> <p>2-Musa I.Tah(1997).Biological control of <i>Alternari asolani</i></p>

By some antagonistic fungi.3rd.Scientific con. Of Salahaddin university. Erbil 3-4 June 1997.

3-Sarmaamy A.Omer,Musal.Taha and Abdulillah.S.(2012)Antifungal Activity of Pomegranate and Oak Galls Extracts Against Penicillium spp and Aspergillus niger .Rafidain Journal of Science .Vol.1.No.2.2011.

4- Abdulkarim K.,Musa I.Taha and Bader K.Ismail.B.kader(2011).Antifungal Activity of Allelopathic Plant Aqueous Extracts and Trichodermaharzianum on Growth of Some Wheat borne Pathogenic Fungi.Koya university Journal No.19 October 2011.

Participation in conferences:-

1-4TH . International Scientific Conference of Salahaddin university- Erbil from 18-20 October2011.

-3rd International Visible Conference on New Trends in Education April 14, 2012 .Ishik university Erbil.

3-The 4th Kurdistan Conference on Biological Science held at Duhok University May 8-10.2014.

Academic training:-

1-Methodes of Teaching from 17th .March to 12th .April 1990.in foundation of Technical institutes .Baghdad –Iraq.

2-Workshop of Hazard Analysis Critical Control Point (HACP) 12TH Aug.to16th .Aug.2000.FAO/Erbil.

3-English language course .July 1st to August 13th.2007.Salahaddin University English language center.

4-English Proficiency Course .15th .june to17th. September 2011.Salahaddin University English Language Centre.

5-Microsoft power point 2003 from 3.8.2009 to 9.8.2009.Salahaddin computer center.

9. Keywords	Microbiology,bacterial(culturing , isolation, morphology)
<p>10. Course overview:</p> <p>The importance of studying these subjects to understanding microbiology and learn how to deal with many instruments in the lab during working as a microbiologist especially how to use microscope which is the first and forever friend for any biologist, student able to make slides and identify different types of microorganisms during this year study using different test, staining techniques and lab index.</p> <p>Microbiology is a wide field including different types of microorganisms (bacteria, fungi, viruses...etc) which are closely related to our daily life.</p>	
<p>11. Course objective:</p> <p>Define the science of microbiology and describe some of the general methods used in the study of microorganisms</p> <p>Discuss the historical concept of spontaneous generation and the experiments that were performed to disprove this erroneous idea</p> <p>Describe some of the various activities of microorganisms that are beneficial to humans</p> <p>Describe procaryotic and eucaryotic morphology, the two types of cellular anatomy, and also the distribution of microorganisms among the various kingdoms or domains in which living organisms are categorized</p> <p>Discuss the importance of the field of microbiology to other areas of biology and to general human welfare</p>	
<p>12. Student's obligation</p> <ul style="list-style-type: none"> * Attendance to the lab on time. * Preparation for sudden exam for the previous lab (quiz) * Must be wearing lab coat, gloves and have biblouse paper with them to clean the microscopes after use * Treat all microorganisms as potential pathogens. * Sterilize equipment and materials. * Disinfect work areas before and after use. ... * Wash your hands before leaving the laboratory. * Never pipette by mouth. * Do not eat or drink in the lab, nor store food in areas where microorganisms are stored. * Label everything clearly. * Long hair should be secured behind your head to minimize fire hazard or contamination of experiments. * Always wipe and clean the lenses of your microscope before putting it away. Use the appropriate tissue paper and cleaning solution for this purpose. * If you are injured in the laboratory, immediately contact your course instructor or TA. * Spills, cuts and other accidents should be reported to the instructor or TA in case further treatment is necessary. 	

13. Forms of teaching

Different forms of teaching will be used to reach the objectives of the course: black board, paper printing, power point presentations for the head titles and definitions also for explaining the microorganisms we use slides either prepared by the students themselves or previous prepared slides (by company)

14. Assessment scheme

Attendance and participation at all course sessions and completion of all assignments are required to receive credit for the course. Two practical examinations will carry out during the course beside the daily quiz and home works.

Practical examination: 30%

Quiz: 5%

15. Student learning outcome:

After completing this course, students will be able to:

- ❖ Understanding what is the microbiology.
- ❖ Recognized and be able to describe features of different types of pathogenic and normal flora of microorganisms
- ❖ Use microscopy tools for studying microorganisms and identify them.
- ❖ Critically read literature in the field of practical microbiology.

❖ **16. Course Reading List and References:**

1. Stephen H. Gillespie (2006) Principles and Practice of Clinical Bacteriology Second Edition.
2. Atlas, Ronald M., Lawrence C. Parks and Alfred E. Brown (1995) Laboratory Manual of Experimental Microbiology.
3. Johnson, T.R. and C.L. Case (2007) Laboratory Experiments in Microbiology.
4. Forbers, A. Betty, Daniel F. Sahm and Alice S. Weissfeld (2007)
5. Baily and Scotts Diagnostic Microbiology 12th ed. Mosby Elsevier.
6. Nester, E.W., Anderson, D.G., et al (2001) Microbiology a human perspective, 3rd ed. The McGraw-Hill Companies, Inc; Chicago, USA.
7. Harley, J.P., Prescott, L.M. (1996). Laboratory Exercises in Microbiology ; The McGraw-Hill Companies, USA.
8. Jawetz, M.; Adelberg, E. A.; Brooks, G. F.; Butel, J. S.; Melnick, J. and Ornston, L.N. Medical Microbiology, Appleton & Lane. (2010).

<p>17. Topics (Part I and II)</p>	
<p>18. Practical Topics</p> <p>Lab 1: Course book and (Safety rules)</p> <p>Lab 2: Microscope, types of Microscope and use of microscope</p> <p>Lab 3: Control of Microbial growth (sterilization and Disinfection).part1.</p> <p>Lab 5:-Control of Microbial growth (sterilization and Disinfection) part2</p> <p>Lab 5: Types of Culture media .</p> <p>Lab 6:- Preparation of culture media.</p> <p>Lab 7: Microflora of the environment</p> <p>Lab 8:- The size, shape and arrangement of bacterial cells</p> <p>Lab 9:-- Cultural characteristics of bacteria</p> <p>Lab 10: -Determination of bacterial motility</p> <p>First practical exam</p> <p>Lab 11:- Bacterial staining (simple staining and negative staining)</p>	

Lab 12 :- Gram staining	
Lab 13 :- Capsule staining	
Lab 14: Spore staining	
Lab 15: Flagella staining	
Lab 16: Acid Fast staining	
Second practical exam	
Lab 17: Fungi staining	
Lab 18: Anaerobic bacteria	
Lab 19: Pure culture	
Lab 20 : Enumeration of microorganisms	
Lab21: Standard plate count	
Lab 22: Most probable number	
Lab 23: Membrane filter technique	
Lab 24: Antibiotic sensitivity test	
Third practical Examination	
Lab26.: - Students seminar	

19. Examinations:

1. Identifying slide: must be identify the slide perfectly and identifying pointed part if they needed.

2. Compositional: In this type of exam the questions usually start with Explain how, what are the reasons for...? Why...? How....?

With their typical answers

Examples should be provided

3. 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

4. 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.

5. Draw and label: in this type question need to draw picture scientifically and labelling all parts of the slide.

20. Extra notes

I would like to be helpful person in my department and support any one wants to understand biology in general and microbiology in specific line.

21. Peer review