

Department of Soil &Water College of Agriculture University of Salahaddin Subject: Fundamental of Soil science Course Book - (class 2)

Lecturer's name:Dr. khunaw Abdulla Rahman

Mc. **Academic Year: 2023/2024**

Course Book

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| 1. Course name | Soil microbial Technique |
| 2. Lecturer in charge | Khunaw Abdulla Rahaman |
| 3. Department/ College | Soil and water Dept./ college of Agriculture |
| 4. Contact | e-mail: [khunaw.rahman@su.edu.krd](mailto:khunaw.rahman@su.edu.krd)  Tel: 07504635810 |
| 5. Time (in hours) per week | For example practical: 2\* 2 |
| 6. Office hours | Sat. 9:00-1:00 off  Su. 8.5.-2.5 .  **Soil microbial Technique**  Mo. 9:00-1:00 Office hours  Tu. 10.30-12.30 student seminar  We. 8:30 - 3:00 Office hours |
| 7. Course code |  |
| 8. Teacher's | High School:1998 |
| acadqaq.m,,eemic profile | BSc at 2002  Master degree at 2007, PhD 2017 |
| 9. Keywords | General Microbiology , Principle of soil science |
| 10. Course overview: |  |
| . Discover the fascinating world of Soil Microbiology, a crucial branch of science that explores the myriad organisms found beneath our feet, integral to the planet's diverse ecosystems. This comprehensive guide will give you profound insights into the basics of soil microbiology, the broad range of organisms that thrive within it, and the pioneering contributions of the renowned 'Father of Soil Microbiology'. Delve deep into why soil microbiology holds a pivotal role in ecology and biochemistry, the techniques employed in the study of soil microbiology, the complex web linking soil microbiology, ecology, and biochemistry. Finally, draw back the veil on diverse microorganisms inhabiting the soil and their respective roles in earth's ecosystems. | |
| 11. Course objective:  To learn how to conserve and utilize microbes . | |

1. Obviously microbes are small. The traditional definition describes microbes as organisms or agents that are invisible to the naked eye, indicating that one needs assistance in order to see them. That assistance is typically in the form of a microscope of some type. The only problem with that definition is that there are microbes that you can see without a microscope. Not well, but you can see them. It would be easy to dismiss these organisms as non-microbes, but in all other respects they look/act/perform like other well-studied microbes (who follow the size restriction).
2. Student's obligation

Lack of attendance and tardiness to class are unacceptable in lecture courses. Obviously unforeseen events can lead to absenteeism and/or tardiness, but those instances are expected to be rare. So, please report to class on time! Due to limitations in support personnel, opportunities to make up missed lecture will not be feasible. If a student is absent for any reason, he/she should email or contacted to departments and the teaching assistant as soon. On as possible. Late assignments will only be accepted at the discretion of the instructor. Typically prompt written documentation will be required to justify the acceptance of late assignments as a result of absenteeism

1. Forms of teaching

We use data show and white board

1. Assessment scheme

The overall grading is 50% and distribute as in this scheme for this course is as follows:

5% quiz

20 % 1st exam

15% review paper

10% seminars

1. Student learning outcome:

Students should understand the basic concepts and the principle of General microbiology and the general information . what is solution and how to prepare the media and what is complex , In General microbiology what is Bacteria and fungi .

and many other simple information in general microbiology like where is bacteria living . A successful

student will learn how to prepare reports in the style of microbial journal, and have some lectures in microbial techniques that would be expected of a student applying to quantities and qualitative experiments in lab.

1. Course Reading List and References:

* https://www.sciencedirect.com/science/book/9780128202029 Mark S. Coyne and James A. Thompson. 2006. Fundamental Soil Science, 1st Edition, Thomson

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| **Part of the book series:** [Soil Biology](https://www.springer.com/series/5138) (SOILBIOL, volume 11) |
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| 17. The Topics: | | Lecturer's name |
| In this section the lecturer shall write titles of all topics he/she is | | Lecturer's name |
| Going to give during the term. This also includes a brief description of the objectives of each topic, date and time of the | | ex: (2 hrs) |
| lecture  Each term should include not less than 16 weeks | | ex: 31 /05/2024 |

1. **Theory topics )**

1. Introduction to Microbiology

2. Microscopes

3. Cell Structure

4. Bacteria: Cell Walls

5. Bacteria: Internal Components

6. Bacteria: Surface Structures

7. Archaea

8. Introduction to Viruses

9. Microbial Growth

10. Environmental Factors

11. Microbial Nutrition

12. Energetics & Redox Reactions

13. Chemoorganotrophy

14. Chemolithotrophy & Nitrogen Metabolism

15. Phototrophy

16. Taxonomy & Evolution

17. Microbial Genetics

18. Genetic Engineering

19. Genomics

20. Microbial Symbioses

21. Bacterial Pathogenicity

22. The Viruses

23- The techniques that is used for isolation and purification microbes form soil

19. Examinations: