BIRZEIT UNIVERSITY

Faculty of Science
Department of Biology and Biochemistry
Second semester 2021/2022
Course syllabus

Course information:

Course code & number: BIOL 243 **Course title: General Microbiology**
Prerequisite: BIOL 111

Instructor information:
Instructor name: Dr. Arwa Abu Khweek
Lectures: Three hours per week and one laboratory session per month
Credit hours: 4 credit hours
Office hours: Posted on Ritaj and on the office door
Office: Science 102

Course description: Introduction to micro-organisms including bacteria, viruses, fungi and protozoa, it includes a brief description of the structure, classification and genetics of micro-organisms, their role in the eco-system, their relationship to human in health and disease, industrial and food microbiology as well as the role of the host immune system in restricting microbial growth.

Course goals:
The major goals of this course are to:

- Study and understand the structure, biochemistry and physiology of bacteria and archaea.
- Study and understand the structure, life cycle, and disease mechanisms of viruses.
- Understand the evolution of microorganisms and their impact on human health.
- Understand how microbial growth can be controlled using antimicrobial agents.
- Understand how microorganisms can be utilized for the benefit of humans as in industrial and food microbiology.
- Understand how the immune system can protect the host from infection and the infectious process.
- Learn the analytical and scientific method of analysis of information.

Course outcome:
By the completion of this course the student is expected to:

1. Identify the major characteristics of bacteria and archaea.

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2. Know the genetics and biochemistry of bacteria and archaea.
3. Understand how viruses replicate in the host and cause disease.
4. Understand how microorganisms can be classified.
5. Understand how microbial growth can be controlled in a clinical context.
6. Understand how the immune system works to protect from infection.
7. Analyze biological results in class and in the lab.
8. Work well in a biological lab setting.
9. Deal with spectrophotometers, microscopes, the aseptic technique, and other important lab tools effectively and flawlessly.
10. Interpret the data they obtain in the lab and provide solid conclusions.
11. Learn how to write thorough lab reports.

Course topics and contents:

Textbook Prescott, Harley, and Klein's Microbiology 11th Edition (International Edition)

Teaching and learning methodologies:
There are two lecture meetings per week and one lab session per month covering three laboratory activities. In the lecture PowerPoint slides will be used. During the lab period, students must come prepared to perform the experiment. It is the responsibility of students to carry the instructions well. During lab times, there will sometimes be a free waiting times where questions and answers and discussions about the material can be discussed. Before each lab session there will be a quiz and after each session there will be a lab report or a sheet to discuss the findings.

Course assessment details:
The grade distribution for the laboratory and the lecture is as follows:

Methods of assessment	Relative weight %
Midterm exam	30%
Assignment	10%
Lab evaluation	25%
Final exam	35%

Text book:

Author	Title	ISBN -13	Edition	Publisher
J.Willey, L. Sherwood, and C. Woolverton	***Prescott's Microbiology***	978-007-131367-4	11th	*McGraw Hill International.*

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Course topics and contents:

Chapter	Topic
1	The evolution of microorganism and Microbiology
3	Bacterial cell structure
4	Archaeal cell structure
7	Bacterial and Archaeal growth
11	Catabolism: Energy release and conservation
14, 16	Regulation of bacterial cellular processes Mechanisms of genetic variation
	Midterm exam
9	Antimicrobial chemotherapy
6	Viruses and other Acellular infectious agent
26	The viruses
27	Microbial interactions
35	Infection and pathogenicity
38 and 39	Human diseases caused by Bacteria and Viruses
	Final Exam

Grading scale:
BZU grading scale is as follows: Excellent 90-99; Very good 80-89; Good 70-79; Acceptable 60-69; Fail <60.

Lab Evaluation: Performance of students in the lab section of this course will be evaluated. Understanding of lab techniques as well as successful preparation of lab reports, quizzes, and sheets (including a final exam) are worth 25% of the final class grade. Some laboratories require the submission of a lab report discussing the experiment, while other laboratories results are assessed through laboratory sheets.

It is essential to buy a NEW lab manual. The manual is in color and colors are essential to decipher laboratory results.

Lab outline:

TOPIC
Introduction, safety rules and microscopes. Streaking
Environmental plate for growth of bacteria.

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Simple staining, Gram staining, and bacterial shapes.
Endospores' staining.
Media preparation and evaluation:
Bacterial population count.
Chemical effects on bacterial growth.
Physical control of microbial growth
Biochemical activities of bacteria.
Final Lab Exam

Students with Disabilities:

I encourage students with disabilities, including "invisible" disabilities such as chronic diseases, learning, and psychological disabilities, to explain their needs and appropriate accommodations to me during my office hours. Please bring a verification of your disability for accommodating your needs.

University honor code

Academic Honesty:

You are expected to comply with the university honor code. Please read it on Ritaj https://ritaj.birzeit.edu/university-laws/#

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