BIOL 2753 EXPLORATION TO GENERAL MICROBIOLOGY (4 credit hours)

Elmira College

SPRING 2025

Required Text:
Madigan MT, Bender KS, Buckley DH, Sattley WM, Stahl DA. 2020, ***Brock Biology of Microorganisms(***16th ed), Pearson, New York, NY.
Supplemental readings might be included to illustrate or expand on textbook readings.

Pre-requisites: BIOL 1300 Introduction to Biology

Course Description
General Microbiology provides a comprehensive exploration of the principles and diversity of microorganisms. The course covers fundamental aspects of microbial biology, including their characteristics, classification, physiology, genetics,clinical microbiology, and an introduction to differentiation. Students will gain a profound understanding of the roles microorganisms play in various environments, industries, and their significance in biological sciences.

Course Objectives and Goals

- Exhibit a grasp of the structural commonalities and distinctions among microbes, emphasizing the distinctive relationships between structure and function in prokaryotic cells.
- Comprehend the fundamentals of microbiology.
- Develop an awareness of the diversity within microorganisms and microbial communities, and discern how these entities adeptly address the fundamental challenges posed by their environments.
- Identify the fundamental principles governing the epidemiology of diseases and the pathogenicity of specific microbes, and appreciate their direct impact on human health.

Evaluation of Performance
Your grade will be based upon your performance on exams, assignments, and participation.

7 Lab and Reports	35%
4 Assignments	20%
Midterm Exam	20%
Final Exam	25%
Total	100%

Grades will be assigned as follows:

A	93% and above	B-	80 - 82%	D+	67 - 69%
A-	90 - 92%	C+	77 - 79%	D	63 - 66%

B+	87 - 89%	C	73 - 76%	D-	60 - 62%
B	83 - 86%	C-	70 - 72%	F	59% or below

Withdrawal Policy: Please see Elmira College Bulletin for information on this policy.

Academic Honesty: Please read the section on Academic Honesty in the **Code of Conduct**. Briefly, academic dishonesty includes: cheating, fabrication, facilitating academic dishonesty, and plagiarism. Ask if you have any questions on whether something constitutes as academic dishonesty. All work must be original and new. Past assignments from current or other courses will not be accepted. Academic dishonesty will not be tolerated. It will result in zero on the assignment, and a report will be filed with the school. Continued practice will result in failure of the class. Institutional penalties may also apply with repeated acts of academic honesty.

Student Responsibility:

- It is your responsibility to keep track of assignments and due dates.
- You should ask questions concerning assignments and lectures, if you need any clarifications.
- If you are struggling in class, have concerns, and/or unsure about expectations, please stop by during office hours or make an appointment for another time.

Tentative Schedule of Topics

Topic	Materials	Tasks & Evaluations
The Microbial World	Chapter 1	
Microbial Cell Structure and Function	Chapter 2	Assignment 1
Microbial Metabolism	Chapter 3	
Microbial Growth and Its Control	Chapter 4	
Viruses and Their Multiplication	Chapter 5	Lab and Report 1
Molecular Biology and Genetics	Chapter 6	
Genetics of Bacteria and Archaea	Chapter 7	Lab and Report 2
Genomics, Synthetic Biology, and Evolution	Chapter 8	
Viral Genomics and Diversity	Chapter 9	Assignment 2
Biotechnology and Synthetic Biology	Chapter 10	
Microbial Evolution and Genome Dynamics	Chapter 11	Lab and Report 3
Metabolic Diversity of Microorganisms	Chapter 12	
Ecological Diversity of Bacteria	Chapter 13	Midterm Exam
Phylogenetic Diversity of Bacteria and Archaea	Chapter 14	
Diversity of Microbial Eukarya	Chapter 15	Lab and Report 4
Microbial Ecology and Environmental Microbiology	Chapter 16	
Microbial Ecosystems	Chapter 17	
Microbial Symbioses with Microbes, Plants, and Animals	Chapter 18	Lab and Report 5
Microbe—Human Interactions and The Immune System	Chapter 19	Assignment 3
Microbial Infection and Pathogenesis	Chapter 20	
Immune Disorders and Antimicrobial Therapy	Chapter 21	Lab and Report 6
Infectious Diseases	Chapter 22	Assignment 4

Epidemiology and Public Health	Chapter 23	
Person-to-Person Bacterial and Viral Diseases	Chapter 24	Lab and Report 7
Eukaryotic Pathogens: Fungi, Protozoa, and Helminths	Chapter 25	Final Exam