BCHM 2356 INTRODUCTION TO BIOCHEMISTRY(4 credit hours)

Elmira College

SPRING 2025

Required Text:

1. David L. Nelson; Michael M. Cox (2021). ***Lehninger Principles of Biochemistry*** (8th ed.). W.H. Freeman & Company.
2. Benjamin F. Lasseter (2020). ***Biochemistry in the Lab*** (1st ed.). CRC Press.

Supplemental readings might be included to illustrate or expand on textbook readings.

Pre-requisites: CHEM 1400 Fundamentals of General Chemistry

Course Description

This course offers a comprehensive introduction to the fundamental knowledge of biochemistry and molecular biology, the study of the chemical processes taking place within living organisms. In the course, students will study the chemistry and biological properties of proteins, carbohydrates, lipids, and nucleic acids, amino acids, vitamins and learn chemical events in living systems, including metabolism and structure-function relationships of biologically important molecules. Upon completion of this course, students will have a deepened comprehension of the chemical mechanisms that underlie life processes and establish a strong foundation for future studies in the field of biochemistry.

Course Objectives and Goals

- Understand the fundamental knowledge of biochemistry and molecular biology.
- Be familiar with the properties of important biomolecules such as proteins, nucleic acids, lipids, carbohydrates, and vitamins, etc.
- Acquire the knowledge of chemical events in living systems, including metabolism and structure-function relationships of biologically important molecules.
- Be able to analyze and describe the chemical mechanisms underlying life processes.
- Be well-prepared to delve deeper into the study of biochemistry or pursue related fields of research.

Evaluation of Performance

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

Assignments	10%
Labs	25%
Reports	25%
Exams	40%
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
Introduction to Biochemistry	Chapter 1	
Water, The Solvent of Life	Chapter 2	Assignment 1
Amino Acids, Peptides, and Proteins	Chapter 3	
Structure of Proteins and Protein Function & Enzymes	Chapter 4	
Carbohydrates and Glycobiology	Chapter 5	*Lab 1: Carbohydrates*
Nucleotides and Nucleic Acids	Chapter 6	Report 1
DNA-Based Information Technologies	Chapter 7	
Introduction to Lipids	Chapter 8	
Biological Membranes and Transport	Chapter 9	*Lab 2: Nucleic Acids*
Biochemical Signaling	Chapter 10	Report 2
Introduction to Metabolism	Chapter 11	
Glucose metabolism: Glycolysis, Gluconeogenesis, and the Pentose Phosphate	Chapter 12	Exam 1
The Metabolism of Glycogen in Animals	Chapter 13	
The Citric Acid Cycle	Chapter 14	*Lab 3: Amino acids and Proteins*
Fatty Acid Catabolism	Chapter 15	Report 3
Amino Acid Oxidation and the Production of Urea	Chapter 16	*Lab 4:*

		Enzyme Activity
Oxidative Phosphorylation	Chapter 17	Report 4
Photosynthesis and Carbohydrate Synthesis	Chapter 18	
Lipid Biosynthesis & Biosynthesis of Amino Acids, Nucleotides	Chapter 19	Assignment 2
Hormonal Regulation and Integration	Chapter 20	*Lab 5: Limpid and Membranes*
Genes and Chromosomes	Chapter 21	Report 5
DNA Metabolism & RNA Metabolism & Protein Metabolism	Chapter 22	
Regulation of Gene Expression	Chapter 23	Exam 2