GENERAL INFORMATION

Course Title: Molecular Biology I, BCHM 3050

Field: Biology

Credit Weight: 4

Semester and Year: Spring 2025

Pre-requisites: BIOL 2010 Introduction to Genetics

Course Description

This course teaches the basic concept and theoretical knowledge of biologically important molecules. The course will help students to discover the diverse range of biochemical, genetic and microbiological approaches needed to understand life at a molecular level. Topics to be covered include gene structure and gene regulation, DNA replication, genetic recombination and protein synthesis, etc. This course will provide students with a solid foundation for studying and researching other major areas such as genetics, cell biology, physiology etc.

Learning Objectives

By the end of this course, students will be able to do the following:

- Demonstrate an understanding of important concepts in molecular biology
- Articulate the flow of genetic information, the chromosome theory of heredity, and the relationship between genetics and evolutionary theory
- Understand and apply diverse range of biochemical, genetic and microbiological research approaches
- Know how to apply appropriate theoretical and practical knowledge to answer biological questions

Required Text/Readings:

James D. Watson, Tania A. Baker, Stephen P. Bell, Alexander Gann, Michael Levine, Richard Losick, (2013). ***Molecular Biology of the Gene*** *(6th ed.)*. Pearson.

Accessibility Services (Accommodations)

Students with documented academic, medical, emotional, and/or physical disabilities, who require accommodation, must provide current documentation attesting to the specific nature of their disability to Carolyn Draht, Academic Accommodations Coordinator and Associate Registrar, at accommodations@elmira.eduor in McGraw Hall room 113. Students are responsible for submitting the appropriate documents and forms in a timely manner. A meeting to review documentation and discuss accommodations is strongly recommended. If you have questions concerning this, please contact me or Carolyn Draht directly.

Academic Honesty

Please read the relevant section of the College's policy on academic honesty in the student Code of Conduct. Briefly academic dishonesty includes: cheating, fabrication, and plagiarism. Please ask me if you have any questions about whether something constitutes academic dishonesty. Academic dishonesty will not be tolerated and will result in failure of the course. Institutional penalties may also apply.

Attendance Policy & Class Participation

You are expected to complete all assignments and exams on time, attend class regularly, and come to class prepared to participate actively. Please have readily available the assigned readings and texts. They will be a valuable resource for our discussions and will assist you in following lectures.

Evaluation of Performance

Final grades will be determined as follow:

Assignments	20%
Lab Reports	30%
Exams	40%
Total	100%

Grades will be assigned as follows:

Grade		Grade	
A	(93- 100%)	C	(73-76%)
A-	(90-92%)	C-	(70-72%)
B+	(87-89%)	D+	(67-69%)
B	(83-86%)	D	(64-66%)
B-	(80-82%)	D-	(60-63%)
C+	(77-79%)	F	(<60%)

Content

Module Topics	**Materials**	**Tasks**
Nucleic Acids; Genetic Information; Gene Structure; Gene Regulation; The Structure of DNA and RNA; Versatility of RNA	Chapter 1-5	Assignment 1
The Structure of Proteins; Protein Synthesis; Techniques of Molecular Biology; DNA Replication; DNA Mutability and Repair	Chapter 6-10	Assignment 2; Lab Report 1; Exam 1
Genetic Recombination; Transcription Mechanism; Transposition; RNA Splicing; Translation	Chapter 11-15	Assignment 3; Lab Report 2;
Genetic Code; The Origin and Evolution of Life; Transcriptional Regulation in Prokaryotes; Transcriptional Regulation in Eukaryotes; Gene Regulation; Systems Biology	Chapter 16-22	Assignment 4; Lab Report 3; Exam 2

This syllabus is subject to change. Keep aware of the changes that might occur. There will be announcement if that happens.