



蘇州大學
Soochow University

BIO 112 Introduction to Molecular and Cell Biology

Summer 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email:TBA

COURSE OBJECTIVES

This is a comprehensive course that delves into the origins of life, the structure and diversity of cells, cellular movements, the cell cycle, and key processes in molecular biology. The course covers essential topics such as cell chemistry, transcription, translation, cell architecture, metabolism, signal transduction pathways, cell division, and the cell cycle. Additionally, students will learn current molecular biological techniques used to study these topics in laboratory settings. Through lectures, laboratory exercises, and discussions, students will gain both theoretical knowledge and practical skills necessary for further studies in cell biology and related fields.

Upon Completion of this Course, students will be able to:

1. Demonstrate a comprehensive understanding of the basic principles of cell biology and molecular biology;
2. Identify and describe the structure and function of key cellular components, including membranes, organelles, and macromolecules;
3. Analyze the molecular mechanisms underlying essential cellular processes such as DNA replication, transcription, translation, and cell signaling;
4. Apply knowledge of cell and molecular biology to interpret experimental data and solve problems in related fields.

PREREQUISITES

BIO 100 Introduction to Biology



GRADING

Grades will be determined by accumulating points, with 100 points being the maximum, as follows:

ITEM	POINTS
5 Labs and Reports	30 Points
2 Quizzes	20 Points
Midterm Exam	20 Points
Final Exam	30 Points
Total	100 Points

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F.$$

We reserve the right to make adjustments to the overall grading policy.

COURSE MATERIALS

Required Texts:

Essential Cell Biology By Bruce Alberts, Dennis Bray, Karen Hopkin, Alexander D Johnson, Julian Lewis, Martin Raff, Keith Roberts, Peter Walter, 4th Edition, 2014.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	<p>Topics: Topic 1: Cells: The Fundamental Units of Life Topic 2: Chemical Components of Cells Topic 3: Energy, Catalysis, and Biosynthesis Topic 4: Protein Structure and Function</p> <p>Assessments: Lab #1 Lab Report #1</p>



Module 2	<p>Topics: Topic 5: DNA and Chromosomes Topic 6: DNA Replication, Repair, and Recombination Topic 7: From DNA to Protein: How Cells Read the Genome Topic 8: Control of Gene Expression</p> <p>Assessments: Lab #2 Lab Report #2 Quiz #1</p>
Module 3	<p>Topics: Topic 9: How Genes and Genomes Evolve Topic 10: Modern Recombinant DNA Technology Topic 11: Membrane Structure Topic 12: Transport Across Cell Membranes</p> <p>Assessments: Lab #3 Lab Report #3 Midterm Exam</p>
Module 4	<p>Topics: Topic 13: How Cells Obtain Energy from Food Topic 14: Energy Generation in Mitochondria and Chloroplasts Topic 15: Intracellular Compartments and Protein Transport Topic 16: Cell Signaling</p> <p>Assessments: Lab #4 Lab Report #4 Quiz #2</p>
Module 5	<p>Topics: Topic 17: Cytoskeleton Topic 18: The Cell-Division Cycle Topic 19: Sexual Reproduction and the Power of Genetics Topic 20: Cell Communities: Tissues, Stem Cells, and Cancer</p> <p>Assessments: Lab #5 Lab Report #5 Final Exam</p>

ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to decrease in overall grade.



Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.

LEARNING REQUIREMENTS

- 1) Late assignments are not acceptable and are subjected to grade deductions.
- 2) Assignments submitted in the wrong format will be counted as not submitted.
- 3) Failure to submit or fulfill any required course component results in failure of the class.
- 4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
- 5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

TECHNOLOGY POLICY

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

ACADEMIC INTEGRITY POLICY

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors



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and any attempts to cheats and plagiarism will be reported to the university administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.

DISABILITY ACCOMMODATION

Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.