



BIO 112 Introduction to Molecular and Cell Biology

Winter 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email:TBA

COURSE OBJECTIVES

This course provides a comprehensive introduction of the basic principles and processes of molecular and cell biology. The curriculum spans the organizational level, from molecule to cell, with a powerful evolutionary theme. Basic topics include biochemistry, genetics, cell biology, and metabolic pathways, topics and case studies such as genetic engineering applications, cellular dysregulation roles. The course aims to give students a better understanding and further exploration of the links between molecular, cell biology and genetics.

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

1. Understand the basic concepts and theories of molecular and cellular biology
2. Synthesize knowledge from molecular and cell biology to understand the interconnectedness of cellular processes
3. Describe the phases of the cell cycle and the regulatory mechanisms controlling cell division
4. Investigate cellular transport mechanisms and their significance in maintaining cellular homeostasis
5. Critically apply these knowledge to scientific experimentation and molecular biotechnologies

PREREQUISITES

N/A

GRADING



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

ITEM	POINTS
Quizzes	20 Points
Midterm 1	15 Points
Midterm 2	15 Points
Case Studies	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:

Zeynep Gromley; Adam Gromley, *Biochemistry, Cell and Molecular Biology, and Genetics*, 1th Edition, Thieme Medical Publishers, 2021.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	Topics: Topic 1: Anatomy of the Cell and Organelles Topic 2: DNA Replication, Gene Mutations, and Repair Topic 3: Transcription and Regulation of Transcription Topic 4: 1.Developmental Genetics Assessments: Quiz#1



Module 2	Topics: Topic 5: Molecular Principles of Cancer Treatments and Therapies Topic 6: Molecular and Biological Techniques Topic 7: Molecular Mediators of Development and Their Functions Topic 8: Thyroid Hormones Regulate the Metabolic Rate Assessments: Quiz#2 Case study 1
Module 3	Topics: Topic 9: Metabolic Acidosis Topic 10: Genetic Code and Mutations Topic 11: Cytogenetics: Chromosomal Basis of Human Diseases Topic 12: Glycosaminoglycans and Proteoglycans Assessments: Midterm#1 Case study 2
Module 4	Topics: Topic 13: General Principles of Signal Transduction Topic 14: Cell Cycle and Control of the Cell Cycle Topic 15: Molecular Principles of Cancer Treatments and Therapies Topic 16: Gene Therapy Assessments: Midterm#2
Module 5	Topics: Topic 17: Digestion and Absorption of Lipids Topic 18: Nutrition and Metabolism Topic 19: Overview of Embryonic Development Topic 20: Molecular Mediators of Development and Their Functions Assessments: Final Exam

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 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.



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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.