



蘇州大學
Soochow University

BIO 397 Advanced Molecular Biology

Summer 2023

Course Credits: 4

Contact Hours: 55 hours

Instructor: TBA

Email: TBA

COURSE OBJECTIVES

This course will consist of There are three basic concepts, the replication of DNA; the structure and function of chromosomes; and the structure and functioning of genes. This course focuses on the advanced concepts and techniques used in molecular biology research. Topics covered include DNA replication and repair, transcriptional regulation, translation, genetic engineering, genomics, and proteomics. Students will gain a deeper understanding of the molecular mechanisms underlying cellular processes and explore current research in the field.

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

1. Demonstrate an advanced understanding of the fundamental principles and mechanisms of molecular biology, including DNA replication, transcriptional regulation, translation, genetic engineering, genomics, and proteomics
2. Apply advanced molecular biology concepts to analyze and interpret research articles and case studies in the field
3. Critically evaluate and discuss current research topics and emerging trends in molecular biology, considering their implications and significance in the scientific community
4. Perform laboratory techniques and experiments commonly used in molecular biology research, including DNA manipulation, PCR, gel electrophoresis, DNA sequencing, and protein analysis
5. Analyze and interpret experimental data obtained from molecular biology experiments, drawing meaningful conclusions and discussing the results in a scientific context



6. Develop effective scientific communication skills by presenting research findings and participating in discussions related to molecular biology topics.

PREREQUISITES

N/A

GRADING

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

ITEM	POINTS
Quizzes	20 Points
Laboratory Reports	20 Points
Midterm	20 Points
Final Exam	40 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:

Molecular Cell Biology, Seventh Edition, by Harvey Lodish, Arnold Berk, and Matthew P. Scott, published by W.H Freeman and Company.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
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Module 1	Topics: Topic 1: DNA Replication, Repair and Recombination Topic 2: Prokaryotic, Eukaryotic Cell Cycles Topic 3: DNA Replication Topic 4: DNA Repair Assessments: Quiz#1 Lab Report#1
Module 2	Topics: Topic 5: DNA Recombination Topic 6: Chromosome structure and function Topic 7: Chromatin, Prokaryotic Operon Structure and Function Topic 8: The Prokaryotic Operon: Promoters Assessments: Quiz#2 Lab Report#2
Module 3	Topics: Topic 9: The Prokaryotic Operon: Operators Topic 10: The Prokaryotic Operon: Control Topic 11: The Eukaryotic Operon: Organization Topic 12: The Eukaryotic Operon: Implications Assessments: Midterm
Module 4	Topics: Topic 13: The Eukaryotic Operon: Transcription Topic 14: The Eukaryotic Operon: Gene Clusters Topic 15: Genes in Organelles Topic 16: Ribosomes Assessments: Quiz#3 Lab Report#3
Module 5	Topics: Topic 17: Protein Synthesis and Translation Control Topic 18: Nuclear Transport Topic 19: Immune System Topic 20: Oncogenes 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



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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.

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.