



蘇州大學
Soochow University

BIO 345 Glycobiology

Summer 2024

Course Credits: 4

Contact Hours: 56 hours

Instructor: TBA

Email: TBA

COURSE OBJECTIVES

This course offers a comprehensive exploration of the intricate interplay between glycobiology and medicine. Participants will delve into the complex world of glycans and oligosaccharides, with a specialized focus on their pivotal roles in human-related physiology and pathology. Participants will gain advanced knowledge in understanding the roles of carbohydrates and glycans in health and disease.

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

1. Understand the advanced concepts in glycobiology.
2. Explore the structural intricacies of carbohydrates and glycans, emphasizing their diverse roles in cellular processes and molecular interactions.
3. Understand the clinical relevance of glycosylation in diseases such as cancer, autoimmune disorders, and muscular dystrophy, with a focus on diagnostic applications.
4. Investigate the detection of glycosylation changes in serum and tissue proteins as potential disease markers, with applications in cancer diagnostics.

PREREQUISITES

BIO 110 Introduction to Biochemistry Major, CHM 331 Advanced Organic Chemistry.

GRADING

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



ITEM	POINTS
Quizzes	15 Points
Assignments	30 Points
Midterm Exam	25 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:

John S. Axford, *Glycobiology and Medicine*, 7th Edition, Springer, 2006.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	Topics: Topic 1: Glycosylation: Disease Targets and Therapy. Topic 2: Long Alkylchain Iminosugars Block the HCV p7 Ion Channel Topic 3: Antibody Recognition of a Carbohydrate Epitope: A Template for HIV Vaccine Design. Topic 4: Interaction of Schistosome Glycans with the Host Immune System. Assessments: Quiz#1
Module 2	Topics: Topic 5: Killer Cell Lectin-Like Receptors and the Natural Killer Cell Gene Complex. Topic 6: Glycosylation Influences the Ligand Binding Activities of Mannose Receptor. Topic 7: Human Immunoglobulin Glycosylation and the Lectin Pathway of



	<p>Complement Activation. Topic 8: Hyaluronan in Immune Processes. Assessments: Quiz#2 Assignment#1</p>
Module 3	<p>Topics: Topic 9: Glycosylation and the Function of the T Cell Co-Receptor CD8. Topic 10: Immunogenicity of Calreticulin-Bound Murine Leukemia Virus Glycoprotein gp90. Topic 11: Glycosylation and GPI Anchorage of the Prion Protein. Topic 12: Glycosylation Defects and Muscular Dystrophy. Assessments: Midterm Assignment#2</p>
Module 4	<p>Topics: Topic 13: Roles of Complex and Hybrid N-Glycans and O-Fucose Glycans in Oocyte Development and Function. Topic 14: Mucin Oligosaccharides and Pigeon Fanciers' Lung. Topic 15: Differential Glycosylation of Gelatinase B from Neutrophils and Breast Cancer Cells. Topic 16: Carbohydrates and Biology of Staphylococcal Infections. Assessments: Quiz#3 Assignment#3</p>
Module 5	<p>Topics: Topic 17: New Developments in Treating Glycosphingolipid Storage Diseases. Topic 18: Fucosylated Glycans in Innate and Adaptive Immunity. Topic 19: Production of Complex Human Glycoproteins in Yeast. Topic 20: Relationship Between the N-Glycan Structures and Biological Activities of Recombinant Human Erythropoietins Produced Using Different Culture Conditions and Purification Procedures. Assessments: 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 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.



蘇州大學
Soochow University

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.