

BIOL 6270/8270**BIOLOGICAL PATHWAYS AND METABOLISM**

Fall 2026 | First Half Term | August 17-October 5, 2026

Instructor	Dr. Andy Truman
Email	atruman1@charlotte.edu
Course website	www.Trumanlab.org
Office	Woodward Hall 486C
In-person meetings	1:00-2:15 p.m., Tuesdays and Thursdays
Classroom	CHHS 109
Asynchronous work	Two recorded class equivalents each week, viewable through Canvas
Office hours	By appointment only

INTENSIVE COURSE FORMAT The full course workload is concentrated into the first half of the semester. Each week includes two in-person meetings and two asynchronous class equivalents. Both exams are completed in person.

Course Description

This course focuses on the basic properties of proteins and how proteins work together in cell signaling and metabolism. The format will be primarily lecture, with a recorded student presentation assignment completed during designated asynchronous work sessions. In the lectures, students are expected to be active participants. The dates and topics listed below are tentative and subject to change depending on how much time is needed for each topic.

Overall Format

The emphasis of this course will be on understanding and knowledge of signal transduction and metabolic pathways as well as current biochemical principles and techniques commonly used in Molecular Biology. The course uses an intensive first-half-term structure: students attend class in person on Tuesdays and Thursdays and complete two additional asynchronous class equivalents each week. Recorded lectures and designated presentation-work sessions will be delivered through Canvas.

Course Prerequisite

Admission to the Ph.D. or M.S. program in Biology or permission of the Instructor.

Textbook (Highly Recommended)

Lehninger Principles of Biochemistry, David L. Nelson and Michael M. Cox, 8th ed., W.H. Freeman, 2025. ISBN-10: 1429234148; ISBN-13: 978-1429234146.

The purpose of the course is not to cover everything in the textbook. Rather, the textbook should be viewed as reference and support material for the course. The textbook contains excellent practice material, and homework assignments may include problems at the end of chapters. Students using an older edition should ensure that they complete the correct assigned problems. Additional material will be posted on Canvas.

Exams and Grading

Assessment	Weight
Exam 1 (in person)	25%
Exam 2 (in person)	25%
Oral presentations (25% presentation; 5% Canvas discussion)	30%
Foldit assignment	15%
Class participation	5%

Grading scheme: 90-100% = A; 80 to <90% = B; 70 to <80% = C; 60 to <70% = D; <60% = F.

Exams

Two exams will be conducted in class via Canvas, and students will be given 60 minutes to complete each exam. Students must bring their own laptops or obtain one from the library in advance. Exam dates are listed in the tentative course schedule.

Oral Presentation and Canvas Discussion Guidelines: Topics in Metabolism/Signal Transduction

Students will work in pairs. Each recorded presentation should be approximately 60 minutes and should be divided equally between both team members. Designated asynchronous sessions in the course schedule are reserved for teams to work on their presentations.

The aim of this task is for students to summarize information from any sources required, including the textbook, primary literature, and other appropriate sources, to create a presentation based on the assigned title. The recorded presentation is worth 25% of the final grade. Students will be assessed on the quality of the slides and how clearly concepts are introduced and explained. An accompanying discussion completed on Canvas is worth an additional 5% of the final grade.

Presentations should be prepared using Microsoft PowerPoint or an equivalent platform. Students will be assessed on formatting, font consistency, image quality, presentation structure, clarity of explanation, and timekeeping. At least one week before the submission deadline, each team should meet with Dr. Truman to discuss a draft version and possible improvements. Final recorded presentations must be uploaded to Canvas by 11.59pm on September 22.

Following submission of the recorded presentations, a Canvas discussion board will be opened for each presentation. Students are expected to respond to questions posted about their presentation. Responses should demonstrate understanding of the topic and should provide clear scientific explanations rather than brief or unsupported answers. Both members of the presenting team are expected to participate in answering questions. When appropriate, students should support their responses with references to the scientific literature.

Possible presentation topics include:

- Role of Biomolecular Condensates/Phase Separation in Signal Transduction
- Epigenetics: DNA Modifications and the Histone Code
- The Warburg Effect and Metabolomic Technologies
- Diabetes: From Insulin Signaling to Precision Therapies
- Role of Protein and RNA Glycosylation in Cell Signaling
- Pushing the Boundaries of Structural Biology
- CRISPR-Mediated Genome Engineering and Its Uses in Research and Disease
- Targeted Protein Degradation and Induced Proximity: PROTACs, Molecular Glues, and Beyond
- Single-Cell and Spatial Omics: Mapping Signaling and Metabolism Within Tissues
- Organelle Contact Sites as Hubs for Metabolism and Cell Signaling

Foldit Assignment

Students are required to download Foldit at <https://fold.it/play#download> and complete Campaign puzzles up to and including "The Right Rotation." Students will submit a screenshot of the completed puzzle and score. This assignment is worth 15% of the final grade.

Course Policies

1. Please read the entire syllabus carefully before continuing with this course. These policies and expectations are intended to create a productive learning atmosphere for all students.

2. The use of cell phones or other communication devices is disruptive and is therefore prohibited during class.
3. All assignments and exams will be completed or submitted online using Canvas unless otherwise specified.
4. The instructor will conduct this class in an atmosphere of mutual respect and encourages active participation in class discussions. The instructor will manage discussions so that ideas and arguments can proceed in an orderly fashion. If a student's conduct during class discussions seriously disrupts the atmosphere of mutual respect expected in this class, the student will not be permitted to participate further.
5. The instructor may modify the standards, requirements, and dates outlined in this syllabus at any time. Notice of such changes will be provided through an announcement in class, Canvas, or email.
6. AI policy: Students may not use AI-based technologies to aid in the completion of their exams.
7. If the instructor is late in arriving to class, students must wait a full 15 minutes after the start of class. If a class meeting is canceled or rescheduled, students will be notified in class or through email or Canvas.
8. No walking in or out during class unless there is an emergency.
9. Students are permitted to use computers during class for exams, note-taking, and other class-related work only.
10. Students are required to bring laptop computers to class to complete class exercises. Students who do not have a computer may borrow one from Atkins Library.
11. Students using computers during class for work not related to the course must leave the classroom.
12. Please use your official UNC Charlotte email address for all course communications.
13. Students are responsible for checking their email and Canvas periodically for course updates or changes.
14. Copyright statement for course materials: Images, artwork, videos, and text presented in class and contained within the PowerPoint presentations on the BIOL 6270/8270 course website will be used for teaching purposes in the context of this course. Students may use this material only for learning and may not disseminate these images, artwork, videos, or text for any other purpose. This is in keeping with the policy on responsible use of University computing and electronic communication resources: <http://legal.uncc.edu/policies/up-307>.
15. Grades from assignments and exams become permanent one week after the grade is issued.

Policy on Missing Exams Due to Emergencies

If you miss an exam because of an emergency situation, a makeup exam will only be permitted with valid documentation from the Office of Student Assistance and Support Services (SASS). SASS can provide notification to faculty of emergency situations when a student is unable to do so and when the office has been made aware of the emergency. SASS may also assist with verification once the student is able to return to classes. The SASS office does not provide verification of absences for car trouble, weather issues, personal activities, work, weddings, vacations, or University-sponsored events.

Students seeking assistance from SASS in verifying an emergency situation may submit an online request form and attach supporting documentation. Students are not required to go through SASS regarding absence verification, and SASS does not have the authority to excuse absences, allow makeup work, or provide other academic accommodations.

University Policies and Resources

Code of Student Academic Integrity

All students are required to read and abide by the Code of Student Academic Integrity. Violations of the Code, including plagiarism, will result in disciplinary action as provided in the Code. Definitions and examples of plagiarism are set forth in the Code and on the Student Accountability & Conflict Resolution website. The Code is available from the Dean of Students Office or online at legal.charlotte.edu/policies/up-407. Additional resources are available on the Student Accountability & Conflict Resolution website.

Student Rights and Responsibilities in Obtaining Disability Qualifications

If you have a disability that qualifies you for academic accommodations, please provide a letter of accommodation from Disability Services at the beginning of the semester. For more information regarding accommodations, contact the Office of Disability Services at 704-687-4355 or visit Fretwell 230 (<https://ds.charlotte.edu/>).

UNC Charlotte Sexual Harassment Policy

UNC Charlotte is committed to maintaining an environment conducive to learning for all students and a professional workplace for all employees. The University takes active measures to create or restore a respectful, safe, and inclusive environment for community members that is free from discrimination, discriminatory harassment, and interpersonal violence. If you or someone you know has experienced any of these incidents, know that you are not alone. UNC Charlotte has staff members trained to support you in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, helping with civil protective orders, and more. Please be aware that all UNC Charlotte employees, including faculty members, are expected to relay any information or reports of discrimination, discriminatory harassment, or sexual and interpersonal misconduct they receive to the Office of Civil Rights and Title IX.

If you tell the instructor about a situation involving these matters, the instructor is expected to report the information. Although the instructor is expected to report the situation, you will still have options regarding how your case is handled, including whether you wish to pursue a formal complaint. The goal is to ensure that you are aware of the range of options available and have access to the resources you need.

To speak confidentially with someone who is not required to report the incident to the Office of Civil Rights and Title IX, contact the University Counseling Center (counselingcenter.charlotte.edu; 704-687-0311) or the Student Health Center (studenthealth.charlotte.edu; 704-687-7400). Additional information is available at civilrights.charlotte.edu under the "Students" tab.

Religious Accommodations

Students will be provided reasonable accommodations for religious obligations in accordance with University Policy #409: Religious Accommodation for Students (<http://legal.uncc.edu/policies/up-409>). This policy authorizes a minimum of two excused absences each academic year for religious observances required by a student's faith and provides students the opportunity to make up missed work. Students should submit requests for religious accommodation to faculty before the census date of the semester.

UNC Charlotte strives to create an academic climate in which the dignity of all individuals is respected and maintained. Therefore, we celebrate diversity, including but not limited to disability, age, culture, ethnicity, gender, language, race, religion, sexual orientation, and socioeconomic status.

Tentative Schedule for BIOL 6270/8270 - Fall 2026

The lecture sequence follows the progression of the previous full-semester course. In-person meetings occur on Tuesdays and Thursdays, with two asynchronous class equivalents assigned each week. Dates and topics are tentative and may be adjusted through Canvas announcements.

	IN PERSON	ASYNCHRONOUS	EXAM	NO CLASS
Week	Date / Timing	Format	Topic / Activity	
1	Mon Aug 17	ASYNCHRONOUS	Introduction to the Course	
1	Tue Aug 18	IN PERSON	Protein Structure and Function - Part 1	
1	Thu Aug 20	IN PERSON	Protein Structure and Function - Part 2	
1	After Thu class	ASYNCHRONOUS	Protein Folding	
2	Before Tue class	ASYNCHRONOUS	Foldit Assignment	
2	Tue Aug 25	IN PERSON	Post-translational Modifications - Part 1	
2	Thu Aug 27	IN PERSON	Post-translational Modifications - Part 2	
2	After Thu class	ASYNCHRONOUS	Work on presentations	
3	Before Tue class	ASYNCHRONOUS	Work on presentations	
3	Tue Sep 1	IN PERSON	Prepare for Exam 1	
3	Thu Sep 3	EXAM	Exam 1 - in person	
3	After Exam 1	ASYNCHRONOUS	Work on presentations	
4	Tue Sep 8	IN PERSON	Protein Synthesis and Degradation	
4	Thu Sep 10	IN PERSON	Protein Interactions	
4	After Thu class	ASYNCHRONOUS	Membrane Proteins	
4	After Membrane Proteins	ASYNCHRONOUS	Enzymes	
5	Before Tue class	ASYNCHRONOUS	Work on presentations	
5	Tue Sep 15	IN PERSON	Signal Transduction I	
5	Thu Sep 17	IN PERSON	Signal Transduction II	
5	After Thu class	ASYNCHRONOUS	Work on presentations	
6	Before Tue class	ASYNCHRONOUS	Glucose Utilization and Biosynthesis	
6	Tue Sep 22	IN PERSON	Citric Acid (Krebs) Cycle	
6	After Tue Sep 22 class	ASYNCHRONOUS	Work on presentations and upload final recording to Canvas - deadline 11.59pm Sep 22	
6	Thu Sep 24	IN PERSON	Oxidative Phosphorylation	
7	After Thu Sep 24	ASYNCHRONOUS	Prepare for Exam 2	
7	Before Tue Sep 29	ASYNCHRONOUS	Prepare for Exam 2	
7	Tue Sep 29	EXAM	Exam 2 - in person	
7	Thu Oct 1	NO CLASS	Reading Day - no required activities	

Presentation Preparation and Submission

All teams may use the designated asynchronous sessions to develop and record their presentations. Final presentations must be uploaded to Canvas by 11.59pm on September 22. The associated presentation discussion will

be completed asynchronously on Canvas; no separate in-person discussion, peer-feedback, preparation lecture, or formal outline class is required.

Important Academic Dates - Fall 2026 First Half Term

Date	Academic Calendar Event
August 17	First day of classes for First Half Term
August 18	Last day to add or drop with no grade by 11:59 p.m.
August 28	Census date; unsatisfactory mid-term grades due by noon
September 7	Labor Day - no classes; University closed
September 9	Last day to withdraw or change grade type for First Half Term by 11:59 p.m.
September 30	Last day of classes for First Half Term
October 1	Reading Day - exams and required activities prohibited
October 2-5	University final-examination period for First Half Term; BIOL 6270/8270 Exam 2 is scheduled for September 29
October 9	Final grades due by noon

Calendar source: [UNC Charlotte Fall 2026 First Half Term Academic Calendar](#)