



# CHM 6306

## Special Topics in Biological Chemistry: “Protein Biophysics”

Spring 2023 (Jan 9 – Apr 26)

### Instructor

Dr. Matthew Eddy  
 matthew.eddy@ufl.edu  
 CBB 302C, 352 294 1048 (office)

### Office Hours

Wed 3:00 - 4:00 PM & by appointment. I will be available to meet both in-person and via Zoom. I am also generally available via email and will make every attempt to respond in 24 hours. If you wait to the last minute to contact me regarding questions for an assignment, I may not get back to you before the assignment due date.

### Lectures

T 9:35 – 10:25 am, Th 9:35 – 11:30 am in Flint 109. Most lectures will be held in-person. Lectures will be recorded and made available via the course Canvas site. All lecture slides will be made available on the course Canvas site.

### Required Textbooks

There are no required textbooks for this course.

### Recommended Reading

The following textbooks are recommended and provide information that complements lecture material. These textbooks are made available through the UF Libraries Reserve and are found either as electronic texts or available to check out for a limited time from the science library.

- “Molecular Biology of the Cell”, 6<sup>th</sup> edition, by Bruce Alberts, Alexander Johnson, et al.
- “Textbook of Structural Biology” (2017) by Anders Liljas
- “Proteins” (2005) by David Whitford
- “Molecular and Cellular Biophysics” (2006) by Meyer B. Jackson

		SPRING SEMESTER 2023							
		S	M	T	W	T	F	S	
Jan.	Holiday	1	2	3	4	5	6	7	
							Registration		
			Drop/Add						
		8	9	10	11	12	13	14	
		15	16	17	18	19	20	21	
Feb.		22	23	24	25	26	27	28	
		29	30	31					
					1	2	3	4	
		5	6	7	8	9	10	11	
		12	13	14	15	16	17	18	
Mar.		19	20	21	22	23	24	25	
		26	27	28					
					1	2	3	4	
		5	6	7	8	9	10	11	
		12	13	14	15	16	17	18	
Apr.		19	20	21	22	23	24	25	
		26	27	28	29	30	31		
								1	
		2	3	4	5	6	7	8	
		9	10	11	12	13	14	15	
May		16	17	18	19	20	21	22	
		23	24	25	26	27	28	29	
		30							
								Commencement	
		1	2	3	4	5	6		
		Comm. Grades Due	Deg. Cert.						
		7	8	9	10	11	12	13	

- “Cell Biology” (2008) by Pollard, Earnshaw, Lippincott-Schwartz, and Johnson
- “The Membranes of Cells” by Philip L. Yeagle.
- “Biophysical Techniques” (2012) by Iain Campbell

Additional selections from both scientific literature and textbooks will be announced on the canvas site and provided by the instructor.

## **Course Description**

This course is intended to provide a fundamental understanding of key techniques used in biophysics and structural biology research laboratories to study biological macromolecules, complexes, and systems at various levels of resolution. This is not intended to be a course covering any one particular method exclusively. The expectation is that students will be able to use knowledge gained in this course to accurately evaluate research articles utilizing biophysical techniques and develop an appreciation for the relative strengths and weaknesses of each technique surveyed. The course is intended to help students use published works in biophysics and structural biology to effectively further their own research, regardless of the particular area of research. The class will also serve as a foundation for students to critically evaluate and present current relevant literature. Applications to modern drug discovery will be discussed. Broadly, topics include: structural biology (i.e., x-ray crystallography, cryo-EM, and nuclear magnetic resonance), pharmacology, biological membranes and their properties, protein engineering, and additional applicable biophysical and biochemical methods.

## **Course Objectives**

The overall learning objective of this course is to develop an understanding of modern biophysical techniques. The following are more specific course objectives.

- Understand the strengths and limitations of key experimental approaches for studying biological macromolecular structure and function
- Be exposed to the practical use of biophysical approaches for the study of macromolecular structure and function
- Judge when the stated scientific conclusions derived from original experimental data are justified and when they are not
- Identify and formulate important new research questions and experiments using examples from recent scientific literature
- Develop and present succinct oral presentations describing specific structural biology and biophysics methods papers and their relationship to other work in the field

## Course Grade Computation

Your letter grade will be derived from weighting the following components of your performance in the class:

- 25% Project-Based Assignments & Additional Written Assignments
- 25% Online & In-Person Quizzes
- 20% Participation in Class
- 15% In-class oral presentations
- 10% Final project

Your course grade will be determined from your total course performance percentage as follows:

>95%	A
93% - 95%	A-
91% - 93%	B+
87% - 91%	B
85% - 87%	B-
82% - 85%	C+
78% - 82%	C
74% - 78%	D
< 74%	E

All grades will be posted in the Canvas GradeBook, as available. Final grades will include rounding. Please note, Canvas does NOT round. Example: If you earn an 89.5 or greater, I will round your final grade up when submitting grades. There is no “curving” grades for the class.

UF's Grading Policy: <http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html>

## Cell Phone & Laptop Policy

Please put all cell phones and other digital devices on “silent mode” during all class periods and avoid use during class. Laptops may be open only if used for following lecture material. Unapproved use of cell phones and other digital devices will result in a reduction of your participation grade.

## Class Attendance and Make-Up Policy

Class attendance and participation is expected and factored into the grade calculation (see above). Excused absences are allowed in accordance with UF policy. If you are feel sick, stay home and let me know you will not be able to attend lecture. I will work with you so that you can obtain lecture materials, information on assignments, and sufficient time to complete your work for the class.

Please note that because there is a deadline for assigning and submitting a grade for your performance in the class, late final project proposal papers and presentations will not be accepted.

## **COVID Policy**

In response to COVID-19, the following recommendations are in place to maintain your learning environment, to enhance the safety of our in-classroom interactions, and to further the health and safety of ourselves, our neighbors, and our loved ones.

- If you are not vaccinated, get vaccinated. Vaccines are readily available and have been demonstrated to be safe and effective against the COVID-19 virus. Visit [one.ufl.edu](https://one.ufl.edu) for screening / testing and vaccination opportunities.
- If you are sick, stay home. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 to be evaluated.
- Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work.

## **Late Submission Policy**

Assignments received past posted due dates will receive a late penalty of 10% per day unless the late submission is approved through prior communication with course instructor. If something arises that prevents you from completing the assignment on time, contact the course instructor right away to request an extension.

## **Students Requiring Accommodations**

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](https://www.dso.ufl.edu/drc/)) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

## **Course Evaluations**

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>

## **Materials and Supplies Fees**

There are no additional fees for this course.

## **University Honor Policy**

This class will operate under the policies of the student honor code, which can be found at: <http://www.registrar.ufl.edu/catalog/policies/students.html>. The students and instructor are honor-bound to comply with the Honors Pledge: *We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.*

**More specific to this course is the expectation that any submitted written assignments are in your own language. This means that submission of verbatim or nearly-verbatim text taken from other sources and repurposed for your own assignments without proper acknowledgement of the original citation will be considered a violation of the honor code and treated as such.**

## **Zoom Presence Policy**

This class may contain hybrid lectures, i.e. lectures that are simultaneously given in-person and broadcast online via Zoom. Our class lectures may be audio and visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

## **Counseling and Wellness Center**

Contact information for the Counseling and Wellness Center:

<http://www.counseling.ufl.edu/cwc/Default.aspx>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

## **Policy on In-class Recording**

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a

University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student