UC San Diego

BIBC 100
Winter Quarter 2023
Galbraith Hall 242
Tuesday and Thursday 3:30 pm to 4:50 pm

Course Information

Instructor: Matt Flagg, Ph.D.
mflagg@ucsd.edu

Office Hours: Wednesday 2:00-3:00 pm **HSS 1145C**
Thursday 2:00-3:00 pm **HSS 1145C**
Additional office hours available by appointment

IAs: Andrés Rivero Gámez—ariverogamez@ucsd.edu
Section **A01**, M 7:00-7:50 p.m. HSS 1305
Section **A02**, M 8:00-8:50 p.m. HSS 1305
Office hour: Tuesday, TBD

Yingyin (Katie) Li—yil097@ucsd.edu
Section **A03**, W 6:00-6:50 p.m. Solis 109
Office hour: Wednesday, TBD

Alyssa Leong— a3leong@ucsd.edu
Section **A04**, W 7:00-7:50 a.m. Solis 109
Office hour: Monday, TBD

Siena Schumaker—sschumak@ucsd.edu
Section **A05**, W 8:00-8:50 p.m. Solis 109
Office hour: Thursday, TBD

Nolan Soutipan—nsoutipa@ucsd.edu
Section **A06**, F 5:00-5:50 p.m. Center Hall 218
Office hour: Friday, TBD

Lara Stettler—lstettle@ucsd.edu
Section **A07**, F 6:00-6:50 p.m. Center Hall 218
Office hour: Wednesday, TBD

Olivia Alcoran—oalcoran@ucsd.edu
Section **A08**, F 7:00-7:50 p.m. Center Hall 218
Office hour: Monday, TBD

Weekly Discussion Boards
Due Sundays by Midnight (see Canvas)

Weekly Quizzes
Due Sundays by Midnight (see Canvas)

Weekly Problem Sets
Due at noon, one week after your assigned section (see Canvas)

Midterm 1
January 31st during class time in our lecture hall

Midterm 2
February 23rd during class time in our lecture hall

Final exam
Tuesday, March 21st from 3 p.m. to 6 p.m., location TBD

Contacting me

Your first source for help should be the discussion boards on Canvas. We will check them on a regular basis. Otherwise, please try to attend my office hours if you have questions related to course material. It is much easier to explain concepts in person than by email. If you need to send me an email, please include "BIBC 100" in the subject line and allow a business day for me to reply. If I have not replied in a business day, please send the email again. I don't respond to email on weekends.

About the Instructor

I got my PhD at UCSD in 2020, and since then I've been alternating between bench work and teaching. In the lab, I've spent about a decade studying protein quality control, and in the classroom, I've spent the last four summers teaching metabolism (BIBC 102). Structural biochemistry is always on my mind, and I genuinely think that macromolecular structure is fascinating, even beautiful.

For now, I'm interested in staying in academia and pursuing a teaching professorship at UCSD. Teaching remains the most challenging thing I've ever done and putting together a new course is … involved. I'm hoping to enjoy this quarter and to keep an eye on my work-life balance.

Course Materials and Tools

Textbooks

There are no required texts for this course. However, Lehninger's *Principles of Biochemisty* and Stryer's *Biochemistry* are both good resources. Harvard has also put together a good Life Sciences textbook. There's a link in the Course Welcome module.

Technology Requirements

The class will be podcast. Podcasts will be uploaded to the Canvas page.

iClickers will be used each class. Please be sure to bring one. You can use an iClicker or the mobile app, **but please choose one and use it every time!**

If you haven't registered your iClicker, please do so ASAP! There is a registration link on our Canvas page, at the bottom of the left-hand-side menu.

All discussion boards are on Canvas.

All quizzes are on Canvas.

Weekly problem sets and exams will be graded using Gradescope.

Grading Information

97%-100%	A+	77-80%	C+
93-97%	A	73-77%	C
90-93%	A-	70-73%	C-
87-90%	B+	60-70%	D
83-87%	B	<60%	F
80-83%	B-		

Assignment	Weight
Discussion Boards	10
Weekly Quizzes	10
Problem Sets	10
Lecture attendance	10
Section attendance	10
Midterm 1	15
Midterm 2	15
Final Exam	20
	100%

Grading Procedure

First and foremost, students in this class will NOT—in any way—be competing with one another for grades. I have no quotas for As, Bs, Cs, etc. I reserve the right to adjust the above scale, but any changes will always work in your favor. I will NOT make grading more stringent.

The midterms and final will be graded in a timely fashion. Grades will be posted on Canvas.

Exam Regrades

All requests for an exam regrade will be taken under consideration. Regrades should be submitted **within a week of the test being handed back**. The request should include an explanation of why additional points should be awarded and **should be emailed to me. Please do not ask for a regrade through Gradescope!**

I will personally evaluate regrades and reply to them in timely fashion.

Attendance and Participation

This is an in-person course, and as you may have noticed, attendance accounts for 20% of your final grade. These are basically “free” points, but I hope they make my emphasis clear. There are hundreds of YouTube videos and online courses about biology. Our classroom and your peers are the most valuable part of this course. I think that should be reflected in the grading.

While attendance and participation are two of my highest priorities, life happens. People have jobs, get sick, etc. So, **four absences from lecture and two absences from section will be excused without question. Absences from lecture and section cannot be substituted for one another**. Absences for any sincerely held religious belief, observance, or practice will be accommodated where reasonable.

Students are required to attend the discussion sections they are enrolled in. There can’t be any exceptions, and students who are not enrolled in a section will be turned away by the IAs. This is a matter of physical space: the rooms we’ve been assigned do not have enough seats for extra attendees.

Meaningful participation on the discussion boards is required each week. You should do one of the following:

1) Ask a meaningful question.
2) Respond to a classmate's question in a meaningful way.
3) Present something interesting and meaningful about the week's topic.

Extra Credit

1% extra credit will be given to the entire class if 90% of the class fills out their CAPES.

Late or Missing Assignments

Online quizzes and discussion boards will be due at the same time every week. Those due dates are listed on Canvas, so barring technical issues, late or missing quizzes or posts will be counted as a zero. If an extenuating circumstance arises, please contact me ASAP, and we can work on accommodations!

Course Format

My goal this winter is to develop a student-centered approach to structural biochemistry, and my working assumption is that it's non-obvious which concepts and examples will help you to best orient and challenge your understanding of the molecular-biological world. I have a set of concepts and examples in mind, of course, but I've learned the hard way that a class is, at best, half baked before it's been presented to and navigated by students.

You'll notice below that there isn't a specific timeline associated with the topics listed. We'll take as much or as little time as needed for each.

At every step along the way, the primary course modality will be "active," in-person learning. Yes, I will be doing some lecturing, and your IAs will do some course review, but peer-peer work is our most important tool. There will be some online work in the form of quizzes and discussion boards, but you should think of working together during discussions and class time as *the* central part of the class.

By the end of the course, we'll ideally have a suite of *useable* ideas and concepts that will give you a foothold in any topic related to macromolecular structure. Rather than memorizing a bunch of protein structures, we should aim to understand the basic questions biologists ask about proteins and why they ask those questions.

General Course Schedule

Topics to be covered
Molecular interactions and thermodynamics
Lipid-bilayer structure
DNA structure
Protein structure and folding
Protein misfolding and aggregation
Binding
Allostery and binding
Catalysis
Catalysis and allostery
Combined binding and catalysis (G Proteins)
Polarity, orientation, and directional movement
Stochasticity
The brain mosaic model

Crosscutting concepts in the course

Chemical bonding, both covalent and non-covalent

Energy of intra- and inter-molecular systems

Equilibrium, steady states, and associated constants

Three dimensional structures and their spatial interactions

Course learning objectives

Use chemical principles to explain biomolecular structures.

Model binding using structures, K_D, and the binding equation.

Model catalysis using structures, K_M, and the Michaelis-Menten equation.

Connect binding and catalysis to biological function.

Use structural biology to understand disease and imagine medicine.

UC San Diego

Student Resources for Support and Learning

Library Help

For questions about eReserves and research tools:
https://library.ucsd.edu/ask-us/triton-ed.html

Learning Resources

Writing Hub
Supplemental Instruction
Tutoring
Mental Health Services

Community Centers

Learn about the different ways UC San Diego explores, supports and celebrates the many cultures that make up our diverse community.
https://students.ucsd.edu/student-life/diversity/index.html

Accessibility

Students requesting accommodations for this course due to a disability must provide a current Authorization for Accommodation (AFA) letter issued by the Office for Students with Disabilities (OSD) which is located in University Center 202 behind Center Hall. Students are required to present their AFA letters to Faculty (please make arrangements to contact me privately) and to the OSD Liaison in the department in advance so that accommodations may be arranged.

Contact the OSD for further information: https://disabilities.ucsd.edu/.
osd@ucsd.edu | 858. 534.4382

Inclusion

I am committed to creating a learning environment that supports diversity of thought, perspective, experience, and identity. This will be key to our success. Science is all about pooling insight and seeing problems from as many perspectives as possible. So, please share your thoughts.

I am also open to anonymous feedback am fully willing to facilitate it.

Office of Equity, Diversity, and Inclusion:
858.822.3542 | diversity@ucsd.edu | https://diversity.ucsd.edu/
https://students.ucsd.edu/student-life/diversity/index.html
https://regents.universityofcalifornia.edu/governance/policies/4400.html

Basic Needs

Any student who has difficulty accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in this course, is encouraged to contact:
foodpantry@.ucsd.edu | basicneeds@ucsd.edu | (858)246-2632

Technical Support

For help with accounts, network, and technical issues:
https://acms.ucsd.edu/contact/index.html

For help connecting to electronic library resources such as eReserves and e-journals:
https://library.ucsd.edu/computing-and-technology/connect-from-off-campus/

For help installing Zoom for video conferencing, virtual office hours, synchronous lectures:
https://blink.ucsd.edu/technology/file-sharing/zoom/index.html

UC San Diego Academic Policies

Academic Integrity

Academic Integrity is expected of everyone at UC San Diego. This means that you must be honest, fair, responsible, respectful, and trustworthy in all of your actions. Lying, cheating, or any other forms of dishonesty will not be tolerated because they undermine learning and the University's ability to certify students' knowledge and abilities. Thus, any attempt to get, or help another get, a grade by cheating, lying or dishonesty will be reported to the Academic Integrity Office and will result in sanctions. Sanctions can include an F in the class and suspension or dismissal from the University. So, think carefully before you act. Before you act, ask yourself the following questions: a: is my action honest, fair, respectful, responsible, and trustworthy, and b) is my action authorized by the instructor? If you are unsure, don't ask a friend, ask your instructor, instructional assistant, or the Academic Integrity Office. You can learn more about academic integrity at academicintegrity.ucsd.edu.
(Source: Bertram Gallant, T. (2017). Teaching for integrity. UC San Diego Academic Integrity Office.)

Refer to:

UCSD Student Conduct Code
(https://students.ucsd.edu/_files/student-conduct/ucsandiego-student-conduct-code_interim-revisions1-16-18.pdf)

Principles of Community
(https://ucsd.edu/about/principles.html)

Religious Accommodation

It is the policy of the university to make reasonable efforts to accommodate students having bona fide religious conflicts with scheduled examinations by providing alternative times or methods to take such examinations. If a student anticipates that a scheduled examination will occur at a time at which his or her religious beliefs prohibit participation in the examination, the student must submit to the instructor a statement describing the nature of the religious conflict and specifying the days and times of conflict.

For final examinations, the statement must be submitted no later than the end of the second week of instruction of the quarter.
For all other examinations, the statement must be submitted to the instructor as soon as possible after a particular examination date is scheduled.

If a conflict with the student's religious beliefs does exist, the instructor will attempt to provide an alternative, equitable examination that does not create undue hardship for the instructor or for the other students in the class.

Discrimination and harassment

The University of California, in accordance with applicable federal and state laws and university policies, does not discriminate on the basis of race, color, national origin, religion, sex, gender, gender identity, gender expression, pregnancy (including pregnancy, childbirth, and medical conditions related to pregnancy or childbirth), physical or mental disability, medical condition, genetic information, ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services (including membership, application for membership, performance of service, application for service, or obligation for service in the uniformed services). The university also prohibits harassment based on these protected categories, including sexual harassment, as well as sexual assault, domestic violence, dating violence, and stalking. The nondiscrimination policy covers admission, access, and treatment in university programs and activities.

If students have questions about student-related nondiscrimination policies or concerns about possible discrimination or harassment, they should contact the Office for the Prevention of Harassment &

Discrimination (OPHD) at (858) 534-8298, ophd@ucsd.edu, or reportbias.ucsd.edu.

Campus policies provide for a prompt and effective response to student complaints. This response may include alternative resolution procedures or formal investigation. Students will be informed about complaint resolution options.

A student who chooses not to report may still contact CARE at the Sexual Assault Resource Center for more information, emotional support, individual and group counseling, and/or assistance with obtaining a medical exam. For off-campus support services, a student may contact the Center for Community Solutions. Other confidential resources on campus include Counseling and Psychological Services, Office of the Ombuds, and Student Health Services.

CARE at the Sexual Assault Resource Center
858.534.5793 | sarc@ucsd.edu | https://care.ucsd.edu

Counseling and Psychological Services (CAPS)
858.534.3755 | https://caps.ucsd.edu

Subject to Change Policy

The information contained in this course syllabus, other than the grade and absence policies, may be—under certain circumstances such as mutual agreement to enhance student learning—subject to change with reasonable advance notice.