

# Structural Biochemistry (BIBC 100)

Fall Quarter 2023

## Course information

**Lectures:** MWF 12-12.50pm

**Discussion sections:** M 5-5.50pm (remote via Zoom)

**Instructor:** Dr Miyyada Boumechache

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Office: HSS 1145B

Office hours: M 10.30-11.30 am.

**Teaching assistant:** Mr Blake Ryan Skrable

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## Important dates

**Midterm test:** Friday 3<sup>rd</sup> November 2023

**Final exam:** Thursday 14<sup>th</sup> December 2023

**Weekly quizzes:** released on Friday and due the following Friday by midnight

**Problem sets:** due Monday at noon one week after they are released.

P.S. All due dates will be specified once the assignment is released.

## Aim of the course

To learn about the structure of biological macromolecules and understand how structural properties influence function.

## Learning Objectives

By the end of the course, students should be able to:

1. Explain the primary and the three-dimensional structure of proteins
2. Discuss how structural properties and binding govern protein function
3. Provide an overview of enzyme catalysis including how enzymes work and how they are regulated
4. Describe the basic structure of nucleic acids
5. Summarize the structure of the main mammalian lipids and how they interact with proteins
6. Outline the structure of the major classes of carbohydrates and their structural and functional roles.

## About the instructor

I graduated with a pharmacy degree from the University of Manchester, United Kingdom, and I obtained a PhD in molecular pharmacology from the University of Cambridge, United Kingdom. I was a senior lecturer at Kingston University London for 4 years where I taught a variety of courses including pharmacy, biochemistry, pharmacology, biomedical sciences, and pharmaceutical sciences. I moved to San

Diego in October last year. My ethos is learning should be accessible to and inclusive of all. I care about each and every student and I will do my best to make the learning journey on this course meaningful, purposeful and fun to all. Please do not hesitate to reach out to me if you have any questions/suggestions/concerns and I will do my best to address those. Outside the classroom you can find me in my office **HSS 1145B** every **Monday 10.30-11.30 am**. You can also email me on [mboumechache@ucsd.edu](mailto:mboumechache@ucsd.edu). I will aim to respond within 3 business days.

## Topics

Protein structure and folding  
Protein function and binding  
Enzymes and catalysis  
Structure and function of nucleic acids  
Structure and function of mammalian lipids  
Carbohydrates and glycobiology

## Schedule

I will apply a flexible schedule to cover the topics listed above in the order shown. Therefore, I have not listed the lectures by titles or dates.

## Course Format

### Lectures

I am a strong advocate of the importance of student participation in teaching sessions. There is substantial evidence from research studies that students' interaction with their peers and with the instructor enhances their learning and enables them to acquire/polish skills that would help them succeed during university and beyond. Please come prepared to **CONTRIBUTE** to the lecture. I will strive to post lecture slides on Canvas a day prior to the lecture, so that you can get a head start!

### Discussion sections

These provide an opportunity for you to substantiate what you have learnt in lectures, and seek answers to your questions. Discussion sections will be led primarily by the TA. All problem sets will be discussed during these sessions. We will also review the midterm test in one of the discussion sections. All discussion sections will be held remotely via Zoom.

## Assessments

There are **5 elements of assessment** for the course. These include:

Weekly quizzes 20%  
Discussion problem sets 20%  
Lecture attendance 5%  
Midterm test 20%  
Final exam 35%

## **Weekly quizzes**

These will be available on Canvas at the end of each week. The quizzes will aim to check your understanding of the material covered in lectures delivered during that week. The questions will be in the format of multiple-choice questions, true false questions and/or fill in the blank. You will have only ONE attempt at each quiz. The questions will not be locked and you can go back and forth to review your answers before submitting the quiz. The quizzes will be due on **Friday by midnight the following week**.

## **Discussion problem sets**

There will be 6 problem sets to cover the main themes in this course: proteins (x2), enzymes, nucleic acids, lipids and carbohydrates. The first problem set will be formative meaning it will not count towards your grades, but it will help inform you about the type of questions and the grading scheme. The problem sets will be posted on Canvas. They will be available for a week, so that you can work through them as we go through the relevant lectures. They will be due on **Monday at noon**, before we discuss them in the weekly discussion section. Submission will be on Canvas, in PDF or doc format.

## **Attendance**

Attendance is expected for both lectures and discussion sections. However, it will only be monitored for lectures using QR code and/or a paper register. You need to achieve a minimum of 80% attendance to be awarded full credit (5% of your final grades). However, if a student fails to achieve the 80% requirement, they can submit evidence to explain reasons for non-attendance for consideration. I will be very reasonable when considering your evidence or justification. I strongly believe that interaction with instructors and peers will enhance your learning experience and boost your motivation.

## **Midterm test**

This will be administered in real time on Canvas during the scheduled lecture time in week 5 on **Friday 3<sup>rd</sup> November**. Lockdown Browser and Respondus monitor will be used to monitor the exam. You can sit the exam at home using your own device or on Campus using University computers (a webcam & a microphone will be needed). You can find more information on lockdown browser and Respondus monitor on this link: [RLDB-QuickStartGuide-CanvasNewQuizzes-Student.pdf \(respondus.com\)](#)

If you think you will not be able to secure access to a laptop or desktop and required peripherals for the test, please email me as soon as possible.

The test will consist of 2 sections:

Section A: 20 Multiple choice questions worth 50% of the test

Section B: 5 Short answer questions worth 50% of the test

The test will be graded out of 100%.

The duration of the test will be 40 min.

## **Final Exam**

This will be a written exam and it will take place during the University exam period on **Thursday 14<sup>th</sup> December**. The duration of the exam will be 2hrs and 59min.

The format of the exam will be as follows:

Section A: 35 multiple answer questions worth 35%

Section B: 5 short answer questions worth 25%

Section C: Long answer questions (choice of 2 out of 3) worth 40%

### Late or missing assignments

A strict deadline policy will be observed for online quizzes and problem sets. The assignments will be locked after the deadline has passed, and you will not be able to access the assignment. If you are unable to meet a deadline for mitigating circumstances, please let me know as soon as possible. I will be reasonably accommodative.

### Grading information

97- 100%	A+	73 - 76%	C+
93 - 96%	A	69 – 72%	C
89 – 92%	A-	65 – 68%	C-
85 - 88%	B+	60 – 64%	D
81 – 84%	B	< 60%	F
77 – 80%	B-		

Grades will be released on Canvas in a timely fashion. Requests for regrading will be taken into consideration. These should be emailed to me no later than a week after releasing grades. You should include a brief explanation of why you think additional points should be awarded.

### Resources

There are no required textbooks for this course. However, I recommend **Lehninger's Principles of Biochemistry**. I have aligned the content of the course with the content of this textbook for your convenience. I also encourage you to identify relevant review articles in the **Journal of Essays in Biochemistry**. I will be posting links to some articles for selected lectures.

The class will be podcast. Podcasts will be uploaded to the Canvas page. Please note there will be no podcast for the first lecture as the request for podcasting has not been processed yet.

Interactive platforms such as Mentimeter and Padlet will be used for in class quizzes and polls. These will require the use of a smart device. Please email me if you do not have access to one as soon as possible.

Other support material will be posted on Canvas as and when needed.

## **Policies**

### **Student Conduct Code**

[Student Conduct Procedures \(ucsd.edu\)](#)

### **Integrity of Scholarship**

[UCSD Policy on Integrity of Scholarship](#)

### **Religious Accommodation**

[Policy: Exams \(including midterms, final exams, and religious accommodations for exams \(ucsd.edu\)\)](#)

### **Discrimination & harassment**

[About OPHD \(ucsd.edu\)](#)

[Policies & Procedures for Students \(ucsd.edu\)](#)

### **Subject to change policy**

The information contained in this course syllabus may be under certain circumstances subject to change with reasonable advance notice.