CHM3218 – Organic Chemistry/Biochemistry 2

Instructor
Dr. Alix Rexford
LEI302
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Office Hours
LEI310*
Monday, Tuesday, Thursday 2:00 – 3:00 pm

*Temporary office
Office hours are available via Zoom by request

Open door policy: If my door is open you're welcome to stop in with a question or just to chat! You don't need to have a question to come to office hours. You're welcome to join in person or online to listen to the conversation, or just have others around while you work through PLAs and other assignments.

Teaching Assistants
Nupur Sehgal

Learning Assistants
- Shezar Ahmed
- Nathan Bougon
- Aryan Lund
- Noah Munoz
- Luis Ramos Cabrera
- Daniel Turko
- Horacio Vega
- Nate Zhivotovsky

Recommended Texts/Videos
There is no required textbook, but you should find a biochemistry resource to prepare for each day's lecture and help in completing assignments. PLAs and small-group session assignments will be the only practice problems that I will assign. ***Module packet assignments*** will be open response questions that are similar in scope to small-group discussion assignments and the review questions in the PLAs.

Suggested Resources:

- AK lectures: https://aklectures.com/subject/biochemistry
- Mentoring Modules in Biochemistry 1 https://store.cognella.com/83688-1C-012
- Lehninger Principles of Biochemistry
- Garrett & Grisham Biochemistry
- Class GroupMe Link:

Prerequisites
CHM 3217 or CHM2211 or permission of the instructor.

Course Objectives
This class covers all of the material commonly found in undergraduate biochemistry courses, with a special emphasis on using concepts from organic and physical chemistry to help students better understand biological chemistry. Topics will include amino acids and proteins, enzyme structure, mechanism, and kinetics, primary metabolism, nucleic acid structure, and metabolism.

Student Learning Objectives

1. Develop a broad vocabulary in chemical biology including common biomolecules, nomenclature, structures, enzyme reactions, and trends found in biological systems
2. Apply the central dogma of molecular biology as an organizing principle in chemical biology
3. Apply chemical trends to predict the kinetic and thermodynamic properties of biological processes.
4. Identify and relate how organic chemistry knowledge controls biological systems
5. Demonstrate an ability to draw reasonable arrow pushing mechanisms for biologically relevant chemical and enzyme reactions
6. Interpret protein-ligand binding interactions and enzyme reaction kinetics
7. Justify the cell's use of metabolic pathways and regulatory mechanisms
8. Draw connections between reactions of biochemical pathways using the logic of metabolism

Class Meetings

Class meets every Mon, Tues, Thurs, Fri from 12:30 - 1:45 pm in LEI 207. Attendance and ACTIVE participation in class is required. Occasional absences are permitted (see grading policy).

Tablets with a stylus are useful but are NOT required; students can easily share their work in real time by securing a phone above their desk or towards a white board. White boards will be available to students in the classroom and can be checked out as needed.

Each class will consist of a combination of lecture, small group discussion, and main group discussions. Your small group will include the same 4-6 students every day. Course assistants and instructors will be available to encourage discussion and assist you in active learning. The goal of these discussion sessions is for students to learn how to apply your newly acquired knowledge to develop a deep understanding of essential concepts in biochemistry. It is important that everyone has a way to share work in real time with their groupmates; you **learn the most by making mistakes** and this classroom should be a safe space to fail and learn how to succeed on larger-stakes assignments.

Grading Policy

The final course grade will be based upon post/pre-lecture assignments, active participation during class, and exam assessments. All assignments should be uploaded to Canvas. If using paper & pen, you are required to SCAN your documents and upload a single PDF. Photos will not be graded and given a grade of 0. If your handwriting is poor, you will be asked to type up written assignments. Failure to do so may result in a grade of 0 if your handwriting cannot be read.

Post/pre-lecture assignments (PLAs) will be available on Canvas at least one week before they are due and will consist of 2-20 questions related to the prior 4 lectures (*recap*) and/or the reading assignments for the upcoming 4 lectures (*looking ahead)*. Prior to completing the assignment, you should review your lecture notes from the previous week's lectures and use the recommended resources to get an introduction to the next day's topics. Problems will be due at 11:59 pm on Wednesdays. PLA's will be graded on completeness of all (50%) questions and correctness of one (50%) randomly selected question.

Participation scores for Modules 1 and 3 will be earned by active participation with the whole class. Assistants will record anytime a student asks or answers a question either in person or using GroupMe during lecture. Importantly, these questions & responses must be in front of the entire class so that all students in the classroom benefit from the question being asked. Students will start with a baseline score of 18/25 points and will gain 2 points for each question or response up to 25 points. Students will have ***roles in the small group sessions*** that will help to foster a team dynamic. Roles will rotate throughout the semester. Your participation in the group and performance in your group role will be evaluated by your group mates to determine your participation score for Modules 2 and 4. For all participation scores, students will lose 2 points for each unexcused absence over 2 absences per module.

The course material is broken into four modules. Each ***module score*** is composed of two or more assessments. Assignment due dates can be found on the Canvas course page. Many of the assignments throughout this course will be graded PASS/FAIL, with a ~90% or better required for a PASS. Two (2) attempts will be allowed for all PASS/FAIL assignments. The goal of this type of grading is ***mastery*** and ensures that students are turning in their best work. Partial attempts will not be graded, as partial credit will not be awarded on PASS/FAIL assignments. All assignments graded in this manner will have ***detailed grading rubrics*** so you will be fully aware of the requirements to earn a PASS.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Module 1: May 12 - 29

- Aqueous environments & buffers
- Amino Acids
- Protein Structure

Module 2: May 30 – June 17

- Enzyme mechanisms, kinetics & regulation
- Carbohydrates
- Nucleotides

Module 3: July 1 – 22

- Lipids
- Cell membranes & transport
- Oxidative phosphorylation
- Metabolic pathways
- Glycolysis

Module 4: July 25 – August 7

- Gluconeogenesis
- Citric acid cycle
- Amino acid metabolism
- Fatty acid metabolism

Dates are subject to change

Important Dates:

- No class: May 26 (Memorial Day)
- No class: June 19 - 30 (Juneteenth & Summer Break)
- No class: July 4 (Independence Day)
- Attendance Mandatory: Regulation Discussion: July 10

- Attendance Mandatory: Oral Exam 1: July 29
- Attendance Mandatory: Oral Exam 2: August 7

Grading Breakdown:

Component	Points	Percentage
Participation	100	10
*PLAs	100 (10/ea)	10
Module 1 Assessments	200	20
Module 2 Assessments	200	20
Module 3 Assessments	200	20
Module 4 Assessments	200	20

Letter grades will be assigned as follows:

Letter Grade	Total points	Letter Grade	Total points
A	> 930	**C+**	780 – 799.9
A-	900 – 929.9	**C**	730 – 779.9
B+	880 – 899.9	**C-**	700 – 729.9
B	830 – 879.9	**D**	600 – 699.9
B-	800 – 829.9	**F**	< 600

Makeup Policy

If an exam or assignment will be missed due to active military duty, religious holy days, or official University activities, the student is required to inform the instructor via email of such absences at least **one week in advance** to make any necessary arrangements.

Email Dr. Rexford prior to the due date to request an extension on any assignment. Extensions are granted on a case-by-case basis.

Regrades and Grading Errors

Mistakes happen and grading errors can be especially frustrating. I will do my best to make sure that you are always kept up to date with your performance in the course and post your grades in a timely manner. It is ***your responsibility*** to make sure that your grade on Canvas reflects the scores you receive on assignments and bring it to my attention ASAP when you notice a discrepancy. If you feel that a grading error was made on a particular assignment you have **one week from the date the grade was posted to Canvas** to request a regrade. Regrades will include a rescore of the entire assignment and may result in a lower score. To request a regrade you should post a comment on the assignment in Canvas including the question that was graded incorrectly and **why you think your answer is correct**.

Privacy Statement

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. Th only allowable purposes are (1) for personal education 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 deliver by an 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 presentation such as patient history,

academic exercises involving solely student 3 Revised: April 2025 participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or guest 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 Honor Code and Student Conduct Code..

Lecture Schedule
A tentative schedule of lectures is available at the course e-Learning site

Tips for Success
Students should be keeping up with suggested readings/videos each day for each day of class. Typical study time to be successful in a course is ~2-3 hours outside of the classroom per hour in the classroom, although some students may require more while others require less. This class meets 4 hours per week, so you should be able to dedicate ~12 hours per week outside of class meetings to this course. I will be posting the lecture slides that are created during lecture to the Canvas site. To keep you on track and engaged in the material, I have designed primer questions for each lecture, as well as review questions from the previous lecture material. After reviewing lecture notes and doing the pre-class reading/videos, **pre-lecture assignments should take less than 3 hours**.

If you are spending considerably more time on PLAs you need to ***evaluate your study habits*** to be more effective. Try taking notes during your pre-class reading/videos and make sure that you are seeing the big picture and not getting bogged down in the details. You can make bullet points of the key concepts and check that you are on the right track using the PLAs as a guide. Notes should not be copied directly from the text or video, but should be re-stated in your own words, and again, condensed to only include key concepts.

There is no required textbook, but I would recommend finding ANY college biochemistry textbook as those will have additional conceptual questions at the end of each chapter. PLAs and small group session assignments will be the only practice problems that I will assign. ***Module packet assignments*** will be open response questions that are similar in scope to small group session assignments and the review questions in the PLAs.

Each small group has their own Canvas page, as well as their own OneNote collaboration space, where your session recorder can upload the session's work. You can also use the group page to post announcements or engage in discussions with just your group members. The main Canvas page discussion board will also be utilized for discussions with the entire class. Your LAs will also set up a GroupMe for class discussions.

Academic Honesty
We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

Use of websites such as Chegg and CourseHero, among others, to complete graded assignments is in violation of both the University honor code and the websites' code of conduct and students who use such unauthorized resources will be investigated and earn a grade of zero for the assignment.

A note about online resources: There are dozens, if not hundreds, of really great resources that you can use to improve your understanding of the subject matter. In fact, I include AK lecture's YouTube series as recommended viewing for students who would prefer videos over reading textbooks. A good resource is one that helps you to think through a problem, not just shows you the answer. A good tutor will never tell you the answer, they will ***lead you to the answer***.

Course Evaluation
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available on the GatorEvals Providing Constructive Feedback FAQ page. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via the GatorEvals website. Summaries of course evaluation results are available to students at the GatorEvals Public Results page. More information about UF's course evaluation system can be found at the GatorEvals Faculty Evaluations website.

Students with Disabilities
Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. See the Get Started With the DRC webpage on the Disability Resource Center site. It is important for students to share their accommodation letter with their instructor and ***discuss their access needs***, as early as possible in the semester.

Campus Resources

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.
Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.
Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.
University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).
UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.
GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273- 4450.