

BCH 3025: Fundamentals of Biochemistry

BCH 3025

Section F2FB

Class #27461

4 Credit Hours

Fall 2022

**Location and Time: Monday and Wednesday, 8:30 am to 9:20 am, MCCB G086
Friday, 8:30 am to 10:25 am, LIT 0101**

Instructor: Diana H. Taft, Ph.D. (pronouns are she/her)
dianataft@ufl.edu
(352)294-3577

Office Hours: Dr. Taft will remain available for students for 20 minutes after most class sessions (if you plan to leave and return, please let Dr. Taft know BEFORE you leave). Dr. Taft is also available for office hours by Zoom. Please email to arrange a time.

Course Website:

Required Text: Biochemistry by Miesfeld and McEvoy, second edition 2021.

Optional Resources: The Manga Guide to Biochemistry by Takemura, Kikuyara, and Sawa

Prerequisites: CHM2210, CHM2211, and CHM 2211L (or CHM2200 and CHM2200L, but the two semester series is STRONGLY preferred) with a minimum grade of C

IMPORTANT NOTE: My past students felt it was critical I warn future students that while this is not a completely flipped classroom, I use lecture mainly to review the more difficult parts of the textbook and use a LOT of hands-on activities that require some understanding of the material. **READ YOUR TEXTBOOK – IT IS CRITICAL TO YOUR SUCCESS!**

Purpose of Course: The course should introduce each student to biochemical concepts and provide different mechanisms for each student to demonstrate to future admission committees or employers the ability to:

- Answer questions about biochemical concepts and facts;
- Critically read the biochemical literature and communicate the finding to peers;
- Utilize the internet to find the most recent credible information concerning biochemical concepts and questions.

Course Goals and/or Objectives: By the end of this course, students will:

1. Appreciate why the broad spectrum of biochemistry is important in medicine, agriculture, pharmaceuticals, and ethics;
2. Understand the basis for the molecular structure of different biochemical compounds;

3. Understand the biosynthesis of basic biochemical “building blocks”;
4. Understand the conformation, dynamics, and function of proteins;
5. Understand the generation and storage of metabolic energy;
6. Understand overall aspects of the integration of metabolic processes;
7. Have developed the skills to accumulate, integrate, and apply biochemical information in their own field of study.

Grading Policies:

Assignment	Percentage of Final Grade
Complete Homework	10%
Midterm exam (two exams given, lowest grade dropped)	30%
Final exam	30%
Final paper	30%

Homework: All homework assignments are due by 11:59 pm ET on the due date. Homework will be graded complete/incomplete. For a complete, an attempt at answering every question must be made regardless of whether or not the answers are correct. Writing “I don’t know” in an answer will result in an incomplete, getting an answer completely wrong in a good-faith attempt will still count for a complete grade. No extensions will be given on homework assignments, however, you may skip 2 of the 12 assignments without grade penalty and no questions asked. It is to your benefit to complete all homework assignments if you can, as assignments are meant to help you prepare for the final paper and exams. If you complete a homework assignment late, I will correct it so you can learn from the assignment, but you will not receive credit for completing the assignment on time.

Final paper: There are two deadlines for the final paper. **NO EXTENSIONS WILL BE GRANTED AFTER THE FIRST DEADLINE.** The second deadline can be seen as an automatic extension – if you need extra time to finish the paper, the time between the two deadlines is your extension. You don’t have to ask, you don’t have to explain, the extension is there if you need it. However, you will lose the guaranteed opportunity to revise your paper for a higher grade if you do not turn your paper in for the first deadline. Because learning to write well is a process that often requires multiple rounds of revision, if you turn in your paper by or on the first deadline, you will receive your grade on the paper with comments at least 1 week before the second deadline, and have the opportunity to revise your paper for a higher grade prior to the final deadline. If you turn your paper in at least one week prior to the second deadline, I will do my best to get comments to you on a first-come first-served basis, but I cannot promise you will have enough time to complete revisions.

Midterm exams: Midterm exams will be in class and closed book. If you need an accommodation (e.g. separate room, longer time) please let Dr. Taft know ASAP so she can make the necessary arrangements. The lowest of the two midterm exam grades will be dropped – even if you don’t take the exam at all. Please know that it is to your benefit to take all exams, as that way you will become familiar with my testing style.

Final exam: The final exam will be in person on December 14 from 12:30 pm to 2:30 pm, location TBD. Please do not plan to leave campus before you take the final.

Masking: I have no way of knowing if anyone in class is at high risk from COVID19, but I want every student to be able to access in person learning. I will provide surgical masks for every student, and offer one every day, but cannot require anyone to wear them. Please know that excess deaths remain well above pre-pandemic levels, and long COVID remains a substantial risk even to vaccinated individuals. I will wear a mask to every class. If you need to lip read, please let me know ASAP as I can use a mask with a clear plastic window – I want EVERY student to feel welcome and able to freely participate in class, but the masks with the clear plastic window are expensive and hard to replace, so I prefer not to use them unless needed.

Extra Credit: THERE WILL BE NO EXTRA CREDIT GIVEN FOR ANY REASON. There is flexibility built into assignments instead, and I feel extra credit is inherently unfair to students who have additional responsibilities and may not have the time to complete extra assignments.

A note on classes: Absences are fine and do not require an explanation. My lecturing for 4 hours a week will present material, but won't necessarily help you learn. Plus, I expect you to read the textbook and I do not want class time to be just me reading slides of information already covered in the book. Therefore, I will frequently seek to use interactive activities instead of a PowerPoint lecture. This means if you miss a class, there may not be slides for you to review. I am happy to review the material with you if you come to office hours, including any missed activities. The more classes you miss, the less helpful I will be in office hours (for example – one missed activity, no problem, I will review it with you. Two weeks of missed classes? Then you are going to have to wait until I've helped everyone else who has come to office hours and try to squeeze all your questions into whatever time remains.) There is an online section of this course if you need more flexibility than an in-person course can provide.

WEEKLY SCHEDULE

Week 1 – August 23 to August 25		
Wednesday	Class activity: what is a donut anyway? Review of course expectations and syllabus	Please read Chapter 1.1 and 1.2 [EXCEPTION: Reading is not expected to be completed before class]
Friday PLEASE NOTE CLASS IS AT LIBRARY – CHECK CANVAS FOR LOCATION	Searching the biochemical literature and citing research	Homework #1: Finding biochemistry papers assigned
Week 2 – August 28 to September 1		
Monday	Lecture: Genetic information and structure and function	Please read Chapter 1.3 and 1.4
Wednesday	Lecture: Physical Biochemistry	Please read Chapter 2
Friday	Lecture: Finish material from Wednesday Class Activity: Modeling cell membranes	Homework #1 Due Homework #2: Assigned Suggested: Finalize selection of news article for final paper
Week 3 – September 4 to September 8		
Monday	No Class, Happy Labor Day!	NA
Wednesday	Lecture: Nucleic Acid Structure	Please read Chapter 3

	and Function	
Friday	Finish material from Wednesday Class Activity: Modelling PCR and Sanger sequencing	Homework #2 Due Homework #3: Nucleic acid worksheet assigned
Week 4 – September 11 to September 15		
Monday	Lecture: Amino Acids and Proteins	Please Read Chapter 4
Wednesday	Lecture: Proteins, continued	Please Read Chapter 4
Friday	Class Activity: Fold It!	Homework #3 Due Homework #4: Protein Worksheet assigned
Week 5 – September 18 to September 22		
Monday	Class Activity: Fold It! Continued	
Wednesday	Lecture: Protein Function	Please Read Chapter 6.1 and 6.2 Suggested date to have found the key paper
Friday	Lecture: Enzymes	Please Read Chapter 7 Homework #4 Due Homework #5: Enzyme worksheet assigned (optional – turn in next Monday for comments before the exam, required due date after exam) Suggested: Finalize scientific articles for paper
Week 6 – September 25 to September 29		
Monday	Class Activity: Brick Breaking NOTE: class may vote to swap Monday and Wednesday class this week.	If HW #5 is returned today, I will return comments to you before the midterm
Wednesday	Midterm Exam Review Session	Midterm covers material discussed through 9/21 (Chapters 1 to 4, 6.1, 6.2, and 7)
Friday	Midterm Exam #1	
Week 7 – October 2 to October 6		
Monday	Lecture: Cell Signaling	Please read chapter 8.1, 8.2, and 8.5
Wednesday	Class Activity: Cell Signaling	Homework #5 Due Homework #6 Assigned Suggested: Have outline of paper complete
Friday	No Class - Happy Homecoming!	
Week 8 – October 9 to October 13		
Monday	Lecture: Glycolysis	Chapter 9
Wednesday	Lecture: The citrate cycle part 1	Please Read Chapter 10
Friday	Class Activity: Glycolysis	There are two activities, and students may choose to do one or both. Please bring a computer, as

		one activity is a Labster activity!
Week 9 – October 16 to October 20		
Monday	Lecture: The citrate cycle part 2	Chapter 10
Wednesday	Lecture: Mitochondria part 1	Chapter 11 Homework #6 Due Homework #7 Assigned
Friday	Class activity: The citric acid cycle	Suggested date to have paper outline complete
Week 10 – October 24 to October 27		
Monday	Lecture: Mitochondria part 2	Please read Chapter 11.4, 11.5
Wednesday	Class activity: Mitochondria	
Friday	Lecture: Carbohydrate structure and function, start of carbohydrate metabolism	Chapter 13.1 and 13.2 Start of Chapter 14 Homework #7 Due Homework #8 Assigned
Week 11 – October 30 to November 3		
Monday	Lecture: carbohydrate metabolism, continued	Chapter 14 Suggested date to have completed first draft of paper
Wednesday	Class activity: Carbohydrates	
Friday	Lecture: Lipids structure, function, and metabolism	Chapter 15.1, 15.2, and 16 Homework #8 Due Homework #9 Assigned
Week 12 – November 6 to November 10		
Monday	Class Activity: Lipids	
Wednesday	Class activity: Lipids	Final paper deadline #1
Friday	No Class – Happy Veteran’s Day	Homework #9 Due Homework #10 Assigned
Week 13 – November 13 to November 17		
Monday	Midterm 2 Review Session	
Wednesday	Lecture: amino acid metabolism	Chapter 17 [NOT on midterm 2]
Friday	Midterm #2	On chapters 8-11, 13-16 (only sections listed as required reading)
Week 14 – November 20 to November 24		
Monday	Lecture: Nucleotide metabolism	Chapter 18
Wednesday	No Class – Happy Thanksgiving!	
Friday	No Class – Happy Thanksgiving!	
Week 15 – November 27 to December 1		
Monday	Lecture: Nucleotide metabolism, continued	Chapter 18 Homework #10 Due Homework #11 Assigned
Wednesday	Lecture: DNA replication, repair, and recombination	Chapter 20.1 and 20.2 Homework #12 Assigned
Friday	Class Activity – amino acids	Final paper deadline #2
Week 16 – December 4 to December 6		
Monday	Biochemistry Stories OR DNA	Homework #11 Due

	Activity – class vote OR catch up if we are running behind from earlier sections	
Wednesday	Review for Final	Homework #12 Due 12/9/22
FINAL EXAM: DECEMBER 14 AT 12:30 PM		

Additional Resources:

The tutoring center if you need more help (or come to office hours, I'd love to see you!):

<https://academicresources.clas.ufl.edu/tutoring/>

The writing studio (will help you learn to be a more effective writer – I encourage you to contact them early about your paper): <https://writing.ufl.edu/writing-studio/>

Life as a student is tough, but the UF counseling and wellness center can help: <https://counseling.ufl.edu/>

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 at <https://gatorevals.aa.ufl.edu/students/>. 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 <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>