BCH 3025: Fundamentals of Biochemistry

BCH 3025

Section F2FB

Class #27461

4 Credit Hours

Fall 2024

Location and Time: Monday and Wednesday, 8:30 am to 9:20 am, MAT0018
Friday, 8:30 am to 10:25 am, MAT0018

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, office hours may be extended if many students have questions). 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 PRIOR TO CLASS – 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. If you are stuck – show your work and your thought process. If you can explain why you are stuck, that counts as a good faith effort. 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 12 from 10:00 am to 12:00 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. 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 in a row or consistently on the same day, the less helpful I will be in office hours (for example – one or two missed classes, no problem and I don't care why, I will review missed material with you. Two weeks of missed classes or never present on Friday? 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 I have left to help students. That said, these are general guidelines, if you have a major unexpected health crisis or some other unexpected and unavoidable life issue that requires a lot of missed classes, come talk to me and I will try, but cannot guarantee, to accommodate you as completely as possible.) 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		
Friday	Class activity: what is a donut anyway? Review of course expectations and syllabus Lecture: Genetic information structure and function	Please read Chapter [EXCEPTION: Reading is not expected to be completed before class] No homework
Week 2 – August 26 to August 30		
Monday	Lecture: Physical Biochemistry	Please read Chapter 2
Wednesday	Class Activity: Modeling cell membranes	Please read Chapter 2
Friday – CLASS IN MARSTON LIBRARY, MSL308	Searching the biochemical literature and citing research	Homework #1: Finding biochemistry papers assigned
Week 3 – September 2 to September 6		
Monday	No Class, Happy Labor Day!	NA
Wednesday	Lecture: Nucleic Acid Structure and Function	Please read Chapter 3

Friday	Finish material from Wednesday Class Activity: Modelling PCR and Sanger sequencing	Homework #1 Due Homework #2 Assigned
Week 4 – September 9 to September 13		
Monday	Lecture: Amino Acids and Proteins	Please Read Chapter 4
Wednesday	Lecture: Proteins, continued	Please Read Chapter 4
Friday	Class Activity: Fold It!	Homework #2 Due Homework #3 Assigned
Week 5 – September 16 to September 20		
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 #3 Due Homework #4 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 23 to September 27		
Monday	Class Activity: Brick Breaking NOTE: class may vote to swap Monday and Wednesday class this week.	If HW #4 is returned today, I will return comments to you before the midterm
Wednesday	Midterm Exam Review Session	Midterm covers all material discussed through 9/23 (Chapters 1 to 4, 6.1, 6.2, and 7)
Friday	Midterm Exam #1	
Week 7 – September 30 to October 4		
Monday	Lecture: Cell Signaling	Please read chapter 8.1, 8.2, and 8.5
Wednesday	Lecture Glycolysis	Please read chapter 9
Friday	Lecture: Catch up, review midterm if necessary Class activity: Cell Signaling	Homework #4 Due Homework #5 Assigned Suggested: Have outline of paper complete
Week 8 – October 7 to October 11		
Monday	Class Activity: Cell Signaling	Please read chapter 8.1, 8.2, and 8.5
Wednesday	Lecture: Glycolysis	Please Read Chapter 9
Friday	Class Activity: Glycolysis	Homework #5 Due Homework #6 Assigned
Week 9 – October 14 to October 18		
Monday	Lecture: The citrate cycle part 1	Chapter 10
Wednesday	Lecture: The citrate cycle part 2	Chapter 10

		Homework #6 Due Homework #7 Assigned
Friday	Home coming, no class!	Suggested date to have paper outline complete
Week 10 – October 21 to October 25		
Monday	Lecture: Mitochondria part 1	Please read Chapter 11
Wednesday	Lecture: Mitochondria part 2	Chapter 11
Friday	Class activity: Citrate cycle	Start of Chapter 14 Homework #7 Due Homework #8 Assigned
Week 11 – October 28 to November 1		
Monday	Lecture: carbohydrates	Chapter 13.1 and 13.2 Suggested date to have completed first draft of paper
Wednesday	Lecture: Carbohydrates	Chapter 14
Friday	Class activity: Mitochondria	Homework #8 Due Homework #9 Assigned Final paper deadline #1
Week 12 – November 4 to November 8		
Monday	Lecture: Lipids	Chapter 15.1, 15.2, and 16
Wednesday	Lecture: Lipids part 2	
Friday	Class activity: Carbohydrates and Lipids	Homework #9 Due Homework #10 Assigned
Week 13 – November 11 to November 15		
Monday	No Class – Happy Veteran's Day	
Wednesday	Midterm #2 Review	
Friday	Midterm #2	On chapters 7.3-11, 13-16 (only sections listed as required reading)
Week 14 – November 18 to November 22		
Monday	Lecture: Amino acid metabolism	Chapter 17
Wednesday	Lecture: Nucleotide metabolism	Chapter 18
Friday – CLASS IN FSHN PILOT PLANT	Class Activity: Soap and lipids	Please read textbook pages 763, 774-776 Final paper deadline #2
Week 15 – November 25 to November 29		
Monday	No class – Happy Thanksgiving!	
Wednesday	No class – Happy Thanksgiving!	
Friday	No class – Happy Thanksgiving!	
Week 16 – December 2 to December 4		
Monday	Lecture: Nucleotide metabolism, if time class activity on amino acids	Homework #11 Due Homework #12 Assigned
Wednesday	Review for Final	Homework #12 Due 12/9/22
FINAL EXAM: DECEMBER 12 AT 10:00 AM		

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/