

FALL 2025 COURSE SYLLABUS
BCH 4024/ BCH 5404: INTRODUCTION TO BIOCHEMISTRY & MOLECULAR BIOLOGY
DISTANCE LEARNING
COURSE COORDINATOR: Dr. Deborah Smith

1. Course Description: *Four (4) credits.* BCH4024 (undergraduate/postbac student section) & BCH5404 (graduate student section) surveys the structure, function, and metabolism of amino acids, proteins, carbohydrates, lipids, and nucleic acids. It introduces concepts in cell structure, replication and growth, and metabolic regulation.

2. Prerequisites: Organic Chemistry (CHM 2210 and 2211, or their equivalents at other universities) or consent of course coordinator. CHM 2200 is not an acceptable prerequisite for BCH4024/BCH5404. The lecturers of the course assume a working knowledge of the concepts and vocabulary of organic chemistry.

3. Necessary Time Commitment and Management: BCH4024/BCH5404 is a very demanding course and will require a substantial time commitment to do well. BCH4024/BCH5404 is a 4 lecture topics per week course (Note that the lecture topics are divided into shorter lecture videos). **Previous successful students report spending at least 10 hours studying per week outside of lecture hours.** You may require more hours if you need to review organic chemistry. *Studying tips from previous students are available in the course information module.* A recommended lecture schedule is on the Canvas “Syllabus” page.

4. Course Objectives:

- Explain the fundamental principles of biochemistry and molecular biology.
- Describe the purpose and interpret the results of common biochemical and molecular techniques.
- Apply the foundational concepts to the analysis and interpretation of biochemical observations.
- Recognize the connection between the basic processes of cells and their impact on overall human health.
- Critically analyze and evaluate primary research articles related to course content.

5. Required Text: *Lehninger Principles of Biochemistry, 8th edition*, by David L. Nelson and Michael M. Cox. New York: Macmillan Learning, 2021.

- You purchase the digital copy of the book through UF All Access. The cost is \$88. You will also get access to Achieve, Macmillan’s online learning platform. **There are required adaptive learning quizzes that are assigned for each lecture topic.**
- The figures used in each lecture slide deck come from this text, unless otherwise specified.
- While there are also suggested readings from the text, the quiz and exam questions are drawn from the lectures. There are NO questions that come specifically from the suggested readings.

6. Web Page: Course material is available on the Canvas E-Learning site: <https://elearning.ufl.edu/>. Access lecture videos and slides by clicking the respective exam module button on the course homepage. Lectures videos are the property of UF and cannot be downloaded. Weekly announcements can be found by clicking “Announcements.” **Students are expected to keep up-to-date with all information communicated through the announcements.**

7. DRC Accommodations: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting

<https://disability.ufl.edu/students/get-started/> . It is important for students to share their accommodation letter with Dr. Smith ASAP via UFL email (dsmith43@ufl.edu).

8. Course Design: The course content is divided into twelve (12) modules. Each module contains topics that are covered in a series of videos. There are five assignment types that assess your understanding of the material at the lecture, topic, module and course level. Please see below for a description of the assignment types and how they are assessed.

9. University Honesty Policy: UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. 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.” [The Honor Code](#) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. Under assignment types in this syllabus (section 12) there are specific explanations about what constitutes authorized assistance. If you have any additional questions or concerns, please consult with the instructor or TAs in this class.

10. Tests and Grading: Students' final letter-grades will be determined based on performance on the assignments listed below. Be sure to note that while there are point values for each assignment, they are separated into weighted categories. The grading scale for this course is based on the performance of the entire class. Updated grading scales will be provided after each exam. Information on the UF grading policy is available at: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

11. Assignment Weighting

Completion Grades		10%
Module Pretest	One at the start of each module (12) Two grades dropped	3%
Playposit	Embedded in each lecture Twelve grades dropped	2%
Achieve	Approximately one per topic Four grades dropped	5%
Graded Assignments		90%
Post Module Quiz	One at the end of each module (12) Two grades dropped	24%
Manuscripts	Two assignments, none dropped	12%
Exams	One after each 3 modules (4) None dropped	64%

The default grading scale for the course is A \geq 90, A- 87-89.9, B+ 84 – 86.9, B 80 – 83.9, B- 77 – 79.9, C= 74 – 76.9, C 70 – 73.9, C- 67 – 69.9, D+ 64 – 66.9, D 60 – 63.9, D- 57 – 59.9, E \leq 56.9. The scale may be shifted downward based on course performance but will never be shifted upwards from this original scale. Updated grading scales will be provided after each exam.

Note: There are two extra credit opportunities in this course. See supplementary information for details.

12. Assignment Types:

Non-graded practice (0%): Each lecture topic contains non-graded practice problems with answers provided. The purpose of this practice is for you to assess your understanding of the topic content. You should complete these problems on your own and then check the answers. Once completed, you can discuss the practice with your classmates, SI leaders, and professors.

Completion Assignments (10%): Three types of completion assignments are described below. For these assignments, you should complete them on your own. Once completed, you can discuss the answers with your classmates, SI leaders, and professors. These assignments cannot be made up, instead there are a number of assignments that are dropped from each category.

Module Pretest (3%): Each module starts with a pretest. You do not need to study for this quiz. The purpose is to give you a preview of the content and assess what knowledge you already possess. Completing the pretest can help you focus your attention on the current content and on particular topics where you are less prepared. The grade for this assessment is a completion grade. Two pre-module quizzes will be dropped from your score.

Playposit (2%): Each lecture has embedded questions. These questions pause the lecture, ensure that you are understanding the material, and help you remain focused for the entire lecture. The grade for this assessment is a completion grade. Twelve playposit assignments will be dropped from your grade.

Achieve Adaptive Learning (5%): Some topics within each module contain a link to your textbook online platform Achieve. The online adaptive learning assignments are intended to quiz you on the basic topic content and keep you on track with your learning. You can access the digital text to assist in answering questions. If you miss a question, the platform will ask you another similar question. The goal is to reach an assigned point value, but it can also be used to quiz yourself before the post module quiz or the exam. Four achieve assignments will be dropped from your grade.

Note: there is no way to remove questions that were not covered in lecture. Please feel free to skip questions that do not apply. Again, no quiz or exam questions come from textbook material that is not covered in lecture!

Graded Assignments (90%): There are two types of graded assignments described below. You are completing these assignments on your own without assistance from any content materials or individuals. They will be taken using the Honorlock proctoring system (described below). At the start of the assessment, you will indicate that you are adhering to the UF honor policy. Any violation of these policies will result in a zero on the assignment and will be reported to the Office of Student Code of Conduct and Resolution.

Post Module Quiz (24%): Your understanding of each module will be assessed by a 15-question post module quiz. These quizzes are closed book and graded. The purpose of these quizzes is to assess what you have learned and to assist you in identifying knowledge areas to focus on for the exams. You will use honorlock for these quizzes and there will be a 30-minute time limit. There are 12 quizzes. There are no make ups for quizzes, instead two scores are dropped from your grade.

Multiple choice exams (63%): There will be a total of four (4) 50-question exams. Exams are closed book. You will use honorlock for exams and there will be a 90-minute time limit with a 30-minute window for technical difficulties (If you have no issues, you can use the extra time for your exam). All four exams will be available from 7:00 AM (EDT/EST) to 11:59 PM (EDT/EST). You must begin your exam NO LATER than 9:59 PM (EDT/EST) to finish your exam by deadline. Exams will cover the material discussed in the specified lecture videos and notes. Students cannot *retake* exams.

BCH5404 graduate students: BCH5404 students have additional requirements for this course, as required by the UF graduate school. **This does NOT apply to BCH4024 students.**

Manuscript Reviews will allow for assessment of student's ability to critically review the literature pertinent to materials presented in lecture. We have selected 2 primary research articles for you to review. There will be 2 OPEN-NOTE quizzes associated with the articles. You will have the opportunity to take each quiz 3 times, and your highest score will be kept. Each quiz will be worth 40pts. These assignments will count as part of the 90% graded assignments. Therefore, they can have a significant impact on your final grade.

The manuscript reviews are designed to introduce you to the idea of critical evaluation of scientific literature – a key aspect of graduate studies. Manuscript #1 is original research in the field of enzyme structure & function. Manuscript #2 is original research in the field of cancer biology.

We understand that, for many of you, reading original scientific literature may be a new concept. To help you with this we have videotaped reviews of each scientific manuscript. You will find a link to download a PDF of the manuscript and the manuscript review video within the "Assignments" section on Canvas. While the manuscripts are associated with certain lectures from the course, everything you need to take the quiz is within the manuscript review videos, meaning you can take the quizzes at any point once you are ready. No extensions will be provided.

By agreement of the faculty, we will **NOT** provide a review of individual student exam results. Be assured that exams undergo a rigorous statistical review of every individual question. The faculty also consider student concerns voiced *immediately* after exams. Adjustments to the answer key may occur and extra points will be awarded based only on the results of the faculty assessment. While exam results are not directly shared, you can request some feedback on your performance.

Honorlock: Post Module Quizzes and Exams will be administered using the Honorlock Chrome extension. Honorlock will provide a scientific calculator when an exam requires one. For all exams you must use Chrome web browser, a computer that is connected to the internet, and a webcam that provides either a front view or side view showing your workspace (see below). You must be the only person in your testing room. Scratch paper is permitted, but you must show the front and back of the paper at the beginning of the exam. Ensure you have a stable internet connection. If your connection is dropped, the exam timer will not stop. *In case of technical issues during an exam, contact Honorlock support IMMEDIATELY! Use the chat feature within Honorlock or go to link below.*

Install Honorlock: <http://www.honorlock.com/extension/install>

Honorlock technical support: <https://honorlock.com/support/>

Honorlock webcam views:



A practice Honorlock quiz is available all semester within the “Quizzes” section. **Students are responsible for ensuring their internet connection and computer are compatible with Honorlock before beginning each exam.**

Make-up exams: Make-up exams will be granted ONLY for emergencies. Students must provide adequate documentation of a need to miss an exam and receive approval by Dr. Smith. Technical issues are not a valid reason for a make-up. You need to take the practice quiz and make sure everything is working properly.

13. Supplemental Materials

Topic Practice Problems: Each topic contains a slide deck of practice problems with answers. These questions are not graded, but do provide an opportunity to engage with the material and ensure that you have a good understanding before taking the post module quiz and the exams.

Discussion Hours: Each instructor will hold a live discussion hour to answer lecture questions. The day & times for these discussions will be announced as the semester progresses.

Extra Credit Opportunities. There are two extra credit opportunities in this course. The points gained will be added to the Exam portion of the course worth 65% of your grade.

Achieve Goal Setting Survey: This is an opportunity for you to think about your goals for this course and check in with yourself about how you are preparing for each exam and if you are reaching your goals. I’m offering up to 8pts of extra credit in order to encourage you to keep track of your learning.

Note: You must complete the initial intro survey to receive ANY credit. Then you can complete the other three if desired. You cannot complete the checkpoint surveys unless you complete the intro survey (you credit will be removed).

Campuswire: Campuswire allows students to post questions and answers while staying anonymous to other students. Students are encouraged to work together to answer each other’s questions. The Teaching Assistants (TAs) will monitor the Campuswire page weekly to ensure student’s answers are correct. Campuswire will be inactive during all exams.

- To join the Campuswire page go to: <https://campuswire.com/c/GA67A9F1A/feed>
 - Register with your UFL email address.
 - Your Campuswire name must match your name listed in Canvas.
 - The class code can be found in the *start here* materials.

- Download Campuswire App for Android or iPhone: <https://campuswire.com/download>
- **Campuswire Grading:** Participation on Campuswire can earn you up to 12 extra credit points. The points you earn will be added to the exam category of assignments, which counts as 65% of your grade. I will download Campuswire's reputation report on August 9th at 7 AM (EDT). No posts after that point will count towards your grade. Campuswire has different reputations status awards (chick, bird, eagle, etc.) but I go strictly by the point values. They will be awarded as follows:
 - No posts will get 0 points.
 - 1 to 50pts will receive 2pts extra credit.
 - 51 to 100pts will get 4pts extra credit.
 - 101 to 300pts will receive 6pts extra credit.
 - 301 to 600pts will receive 9pts extra credit.
 - 600pts will receive 12pts extra credit.
- Unprofessional and/or plagiarized posts will be removed and will not count towards reputation points.
- Additionally, when creating a post, be sure that you are making meaningful contributions to the discussion. Explain why you chose a certain answer or why you think another student has an incorrect answer. Avoid phrases like "good answer" or "nice job". Inappropriate posts will be removed and will not count towards reputation points.

***There is a STRONG correlation between activity on Campuswire and overall grades. Those who are active on Campuswire throughout the semester tend to do significantly better in the course than those who are not active on Campuswire. ***

14. Supplemental Instruction (SI): Optional FREE group tutoring sessions will be offered via Zoom by the SI program. The SIs are previous BCH4024 students who have been selected for the SI teaching program and are in their 2nd or 3rd semester as a tutor. The SI program is very popular and highly effective. We strongly encourage all students to participate (including graduate students). **Attendance is required to remain in the SI program.** Students are permitted 3 absences for the entire semester. Signup information will be announced during the 1st week of class. Participation is not a requirement of the course but is highly encouraged.

SI Leaders volunteer their time and do not get paid for their work. If you have questions outside of your session time, post your questions on Campuswire. SI Leaders are students as well. Please respect their time.

For those who cannot attend SI tutoring sessions, practice questions constructed by the SI program will be made available. *The lecturing professors do NOT participate in making the practice questions*; thus the practice questions may not reflect the type of questions seen in the exams. The practice questions should be used to gauge your knowledge. The TAs will also provide review videos that can be viewed on your own time.

15. Course Communications: Students are responsible for regularly checking announcements for important updates. Questions about course organization & operation, including grades, should be directed to Dr. Smith using the Canvas email system.

How to send a message on Canvas: <https://community.canvaslms.com/t5/Student-Guide/How-do-I-send-a-message-to-a-user-in-a-course-in-the-Inbox-as-a/ta-p/502>

Each lecturer is responsible for his/her own material. Individual faculty members determine their method for answering course material questions and policies governing those interactions.

All emails must be sent from a UF email address.

Dr. Deborah Smith – Course Coordinator (**Use Canvas email**) dsmith43@ufl.edu

**Please email Dr. Smith for questions regarding course administration, management, and grades.*

Dr. Deborah Smith (“DLS”) dsmith43@ufl.edu

Dr. Mireille Aleman (“MJA”) Mireille.aleman@ufl.edu

Dr. Lauren Douma (“LGD”) ldouma@ufl.edu

16. Privacy: Students who participate in live online office hours or review sessions with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally agree to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

17. Course Evaluations: 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 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 ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at gatorevals.aa.ufl.edu/public-results/

COURSE OUTLINE FOR SPRING 2025
BCH 4024/ BCH 5404: INTRODUCTION TO BIOCHEMISTRY & MOLECULAR BIOLOGY

**COURSE INFORMATION (Syllabus) QUIZ OPENS at 7:00 AM (EDT) on August 21st &
CLOSES at 11:59 PM (EDT) on August 28th**

An editable calendar schedule is available on the “Syllabus” page of the Canvas site.

<u>Module</u>	<u>Lecturer</u>	<u>Lecture Topic</u>	<u>Due Date</u> <u>(11:59pm EDT/EST)</u>
1	DLS	Amino Acids and Peptides Introduction Water Amino Acids Proteins	August 28th
2	DLS	Protein Structure and Function Protein Structure Protein Function – Non-enzymatic Protein Function – Enzymatic	September 3rd
3	DLS	Carbohydrates and Lipids Carbohydrates Lipids	September 8th
EXAM 1 Saturday, Sept 13th [M1-3] OPENS at 7:00 AM & CLOSES at 11:59 PM			
4	MJA	Membrane Proteins and Signaling Membranes Membrane Proteins and Membrane Dynamics Transport Signaling	September 20th
5	MJA	Carbohydrate Metabolism Glycolysis Gluconeogenesis Glycogen Metabolism Carbohydrate Metabolism and Regulation	September 27th
6	MJA	Cellular Respiration The Pyruvate Dehydrogenase Complex The Citric Acid Cycle The Electron Transport Chain Oxidative Phosphorylation	October 4th

EXAM 2 Saturday, Oct 11th [M4-6] OPENS at 7:00 AM & CLOSES at 11:59 PM

7 MJA **Lipid Metabolism** **October 18th**
Lipid Catabolism
Ketone and Fatty Acid Synthesis
Cholesterol and Plasma Lipoproteins
Metabolism of Carbohydrates and Lipids: Review and Application

8 MJA **Nitrogen Metabolism** **October 25th**
Introduction to Nitrogen Catabolism
Transamination and Deamination Reactions
Nitrogen Excretion and the Urea Cycle
Ammonia Toxicity and Assimilation

9 MJA **Nucleotide Synthesis** **November 1st**
Biosynthesis of Nutritionally Nonessential Amino Acids
Biosynthesis of Specialized Biomolecules from Amino Acids
Pyrimidine Nucleotide Biosynthesis
Purine Nucleotide Biosynthesis

EXAM 3 Saturday, Nov 8th [M6-9] OPENS at 7:00 AM & CLOSSES at 11:59 PM

10 LGD **DNA Structure and Genome Organization** **November 15th**
DNA Structure and Genome Organization
Genomic Enzymes
DNA Replication in Prokaryotes
DNA Replication in Eukaryotes

11 LGD **Transcription and Translation** **November 22nd**
Prokaryotic Transcription
Eukaryotic Transcription
Post-Transcriptional Modifications
Translation

12 LGD **The Cell Cycle and Cancer** **December 3rd**
DNA Damage and Repair
The Cell Cycle
Molecular Basis of Cancer

EXAM 4 Tuesday Dec 9th [M10-12] OPENS at 7:00 AM & CLOSSES at 11:59 PM