FALL 2024 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 per week course. **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 assigned for each lecture topic.**
- 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. 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/

10. Assignment Weighting

Completion Grades		15%
Module Pretest	One at the start of each module (12)	5%
Playposit	Embedded in each lecture	5%
Achieve	Approximately one per topic	5%
Graded Assignments		85%
Post Module Quiz	One at the end of each module (12)	20%
Exams	One after each 3 modules (4)	65%

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

11. Assignment Types:

Module Pretest (5%): 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.

Playposit (5%): Each lecture has three or four embedded questions. These questions pause the lecture, assure that you are understanding the material, and that 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 contains 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.

Please 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!

Post Module Quiz (20%): Your understanding of each module will be assessed by a 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. There are 12 quizzes, two scores will be dropped from your grade.

Multiple choice exams (65%): There will be a total of four (4) exams, each 90 minutes long with 50 questions. 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/ST) to finish your exam by deadline. Exams will cover the material discussed in the specified lecture videos and notes. Students cannot *retake* exams.

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.

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 which can be turned to give a 360° view of your testing room. 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/

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

Note:. BCH5404 graduate students have additional manuscript review assignments to elevate the course to the graduate level. If you hear anything or see any announcement about these assignments**, they do not apply to BCH4024.**

12. 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 topic material and ensure that you have an understanding of the material 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

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.
  - Use the class code: 4713

- 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. These points will be added to your point value for the course and will be calculated into your average. 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 & 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. ***

13. 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.

14. 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

15. 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 are agreeing 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.

16. 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 FALL 2024
BCH 4024/ BCH 5404: INTRODUCTION TO BIOCHEMISTRY & MOLECULAR BIOLOGY

COURSE INFORMATION QUIZ OPENS at 7:00 AM (EDT) on August 22nd & CLOSES at 11:59 PM (EDT) on Auguest 29th

A recommended lecture viewing schedule is available on the "Syllabus" page of the Canvas site.

Module	Lecturer	Lecture Topic	Due Date (11:59pm EDT/EST)
1	DLS	**Amino Acids and Peptides** Introduction Water Amino Acids Proteins	**Aug 29**
2	DLS	**Protein Structure and Function** Protein Structure Protein Function – Non-enzymatic Protein Function – Enzymatic	**Sept 5**
3	DLS	**Carbohydrates and Lipids** Carbohydrates Lipids	**Sept 10**
EXAM 1	**Friday Sept 13th**	**[M1-3] OPENS at 7:00 AM & CLOSES at 11:59 PM (EDT)**	
4	MLA	**Membrane Proteins and Signaling** Membranes Membrane Proteins and Membrane Dynamics Transport Signaling	**Sept 19**
5	MLA	**Carbohydrate Metabolism** Glycolysis Gluconeogenesis Glycogen Metabolism Carbohydrate Metabolism and Regulation	**Sept 26**
6	MLA	**Cellular Respiration** The Pyruvate Dehydrogenase Complex The Citric Acid Cycle The Electron Transport Chain Oxidative Phosphorylation	**Oct 3**
EXAM 2	**Friday Oct 11th**	**[M4-6] OPENS at 7:00 AM & CLOSES at 11:59 PM (EDT)**	

7	MLA	**Lipid Metabolism** Lipid Catabolism Ketone and Fatty Acid Synthesis Cholesterol and Plasma Lipoproteins Metabolism of Carbohydrates and Lipids: Review and Application	**Oct 17**
8	MLA	**Nitrogen Metabolism** Introduction to Nitrogen Catabolism Transamination and Deamination Reactions Nitrogen Excretion and the Urea Cycle Ammonia Toxicity and Assimilation	**Oct 24**
9	MLA	**Nucleotide Synthesis** Biosynthesis of Nutritionally Nonessential Amino Acids Biosynthesis of Specialized Biomolecules from Amino Acids Pyrimidine Nucleotide Biosynthesis Purine Nucleotide Biosynthesis	**Oct 31**

EXAM 3 Friday November 8th [M6-9] OPENS at 7:00 AM & CLOSES at 11:59 PM (EST)

10	LGD	**DNA Structure and Genome Organization** DNA Structure and Genome Organization Genomic Enzymes DNA Replication in Prokaryotes DNA Replication in Eukaryotes	**Nov 14**
11	LGD	**Transcription and Translation** Prokaryotic Transcription Eukaryotic Transcription Post-Transcriptional Modifications Translation	**Nov 21**
12	LGD	**The Cell Cycle and Cancer** DNA Damage and Repair The Cell Cycle Molecular Basis of Cancer	**Dec 4**

EXAM 4 Friday, December 13 [M10-12] OPENS at 7:00 AM & CLOSES at 11:59 PM (EST)