

# BCH4024: INTRODUCTION TO BIOCHEMISTRY & MOLECULAR BIOLOGY

SPRING 2024 – 4 CREDIT HOURS

MEDICAL SCIENCES BUILDING AUDITORIUM [ROOM N2-200](#)

M/T/W/F 4<sup>TH</sup> PERIOD (SECTION: 11032) OR 6<sup>TH</sup> PERIOD (SECTION: 11035)

**COURSE COORDINATOR:** Lauren Douma, Ph.D.  
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ARB R3-254  
352-294-8683 (use email)

**DRC ACCOMMODATIONS:** [BIOCH-MAIL-BCH4024@mail.ufl.edu](mailto:BIOCH-MAIL-BCH4024@mail.ufl.edu)  
*Letters must be sent at least 3 business days prior to exam*

**COURSE INSTRUCTORS:** Daniel L. Purich (“DLP”), Ph.D.  
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Mireille J. Aleman (“MJA”), Ph.D.  
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**DISCUSSION HOURS:** AKA office hours. Each lecturer is responsible for their own material. Lecturers will announce their discussion hour format when their section begins. This information will also be posted on Canvas.

**MEET WITH DR. DOUMA:** Dr. Douma is available to meet one-on-one with students to discuss studying habits, accommodations, grade inquiries, and other course management-related inquiries. Click the “Meet with Dr. Douma” link on the Canvas homepage to schedule a meeting.

**COURSE WEBSITE:** <http://elearning.ufl.edu>

**COURSE COMMUNICATIONS:** Students are responsible for keeping up with announcements on Canvas and in class. Professors will communicate with individual students using Canvas or UFL email. Note that the UFL email spam filter will filter out emails from gmail, yahoo, or any other non-UFL email addresses.

**RECOMMENDED TEXTBOOK:** *Lehninger Principles of Biochemistry, 8th edition, by David L. Nelson and Michael M. Cox. New York: Macmillan Learning, 2021.* The book can be purchased through UF All Access. Used copies of the 7th edition are widely available. The textbook and Achieve is **NOT required**.

**COURSE DESCRIPTION:** BCH4024 provides a survey of the structure, function, and metabolism of amino acids, proteins, carbohydrates, lipids, and nucleic acids. It introduces concepts in molecular biology, including replication, gene regulation, transcription, translation, and control of cell growth.

**PREREQUISITES:** Organic Chemistry (CHM 2210 and 2211, CHM 2215 and 2216, or their equivalents at other universities). CHM 2200 is not acceptable.

**COURSE GOALS:** By the end of this course, students should be able to:

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

**SI PROGRAM:** The Supplementary Instruction (SI) Program is a free, facilitator-led group study in which a trained peer, who has previously excelled in BCH4024, leads weekly tutoring sessions to review challenging course material. We strongly encourage students to participate in the SI Program. During the first week of class, an announcement containing all details regarding SI sign-up will be posted. All SI sessions will be held online via Zoom. We also offer Zoom “walk-in” tutoring sessions and Q&A on Campuswire available to all students in the course. SI Leaders are NOT permitted to provide recorded lectures for students.

## COURSE POLICIES:

**ATTENDANCE POLICY:** We want to emphasize that attendance is central to success in this course. Students who regularly attend class and seek assistance or clarification score higher in BCH4024 than those who do not. Office hours for lecturers will be announced in class and posted on Canvas. \*\*Lectures will NOT be recorded, and there are NO Zoom options available. Students are welcome to record the lectures for personal use (see “In-Class Recordings” under UF Policies section)\*\*

**SOCIAL MEDIA:** Students sharing course materials or information through any large social media site, such as GroupMe or Chegg, is strictly **PROHIBITED**. Establishing or participating in a site will be considered a violation of the UF Honor Code. The Honor Code states, Section 3 Violations of the Student Honor Code Item 2, "Using any materials or resources, through any medium, which the Faculty has not given express permission to use and that may confer an academic benefit to the Student." (page 13). **SI Leaders are the only individuals permitted to make GroupMe boards for BCH4024.**

**ASSEMBLY EXAM DATES:** All exams will be administered through Canvas using Honorlock. BCH4024 is designated an assembly exam course. UF registrar has assigned us the following exam dates and times:

- **Exam 1 (100 pts): Wednesday, February 7 at 8:20 PM**
- **Exam 2 (100 pts): Thursday, February 29 at 8:20 PM**
- **Exam 3 (100 pts): Monday, April 8 at 8:20 PM**
- **Exam 4 (100 pts): Wednesday, May 1 at 10:00 AM\***

**MAKE-UP EXAM POLICY:** Make-up exams will be provided in case of an approved academic conflict or emergency. **No student will be allowed to take more than one makeup exam.** No makeup exam is available for Exam 4 due to the UF grade deadline. Examples of valid reasons for missing an exam include illness, injury, or some unforeseeable academic conflict. **Vacations ARE NOT a valid excuse.** To submit a makeup exam request:

- *Submit a DSO Instructor Notification request:*  
<https://care.dso.ufl.edu/instructor-notifications/>

- *After submitting the DSO request, you must also email Dr. Douma directly confirming you have submitted a DSO instructor notification request and have read the makeup exam policy. This must be completed within 24 hours of the exam.*

Makeup exams will take place exactly one week after the originally scheduled exams. Makeup exams are not cumulative and are designed for equal difficulty. There is no make-up of a make-up exam.

#### **HONORLOCK POLICIES:**

Honorlock proctoring will be used for all exams. Honorlock will provide a scientific calculator. For every exam you must use:

- Chrome web browser: <https://www.google.com/chrome/>
- Honorlock: <http://www.honorlock.com/extension/install>
- A webcam, either an internal or external camera can be used. Cameras must be positioned to show your desk/scratch paper up to and including your head **throughout** the exam.
- You must be the only person present in your testing room.
- A pen/pencil and two (2) blank pieces of scratch paper are permitted.
- ***No other items are permitted while taking the exams.***
- Your eyes must remain on your scratch paper or computer screen.
- It is highly recommended to take exams on a computer that is HARD-WIRED to the internet. WiFi may provide an unstable connection.
- Apple Handoff must be turned off on Macs.
- ALL students must take the practice Honorlock Practice quiz on Canvas before EVERY exam. Failure to take the quiz before an exam means you accept responsibility for any technical issues that occur.

**Failure to follow these policies, or cheating of any kind will NOT be tolerated and will be reported to the UF Honor Court. A grade of 0% will be assigned if a student is found guilty of cheating or not following exam policies.**

## TECHNICAL ISSUES:

Each exam has 20 additional minutes built in for possible technical issues. Most technical issues fall within this timeframe and will not impact the actual exam time (90 minutes). No additional time will be added.

The course instructors are unable to assist with technical issues during an exam. If you experience a technical issue during the exam, you must immediately contact Honorlock IT support via:

- <https://honorlock.com/support/>
- The chat icon in the bottom-right corner of the exam screen.

If a student experiences issues with their computer or accessing Canvas, contact the UF Computer Help Desk via:

- <http://helpdesk.ufl.edu>
- (352) 392-HELP - select option 2

***Any requests for make-up exams due to technical issues MUST be accompanied by the Honorlock chat transcript and/or ticket number received from the UF Help Desk when the problem was reported to them.*** You MUST e-mail the course coordinator immediately if you wish to request a make-up.

## EXAM FORMAT:

All exams will be comprised of 50 multiple-choice questions worth 2 points per question (100 points total). There are no cumulative exams.

Students will have 90 minutes to complete the exam. An additional 20 minutes will be added to the exam time for possible technical issues (110 minutes total).

## EXAM REVIEWS:

Exams will not be released to the entire class for review. 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 points will be awarded based on the results of the faculty assessment.

If a student wants to review their exam, they must email the course coordinator **within one week** after grades are released. There is NO possibility of additional points once grades are released. Exam reviews

are purely for educational purposes and ARE NOT appropriate means of gaining a letter of recommendation.

**COURSE EVALUATION:** Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semesters, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>.

## UF POLICIES:

**UNIVERSITY POLICY ON ACCOMMODATING STUDENTS WITH DISABILITIES:** Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc](http://www.dso.ufl.edu/drc)) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

**UNIVERSITY POLICY ON ACADEMIC CONDUCT:** 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 honesty 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 (<http://www.dso.ufl.edu/sccr/process/student-conduct-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 the course coordinator. If you have any questions or concerns, please consult with the course coordinator.

**CLASS DEMEANOR:** All members of the class are expected to follow rules of common courtesy in all lectures, SI sessions, email messages, discussion hours, and any other course-related events. This includes silencing phones before class begins, no talking during lectures, and sitting towards the back of the lecture hall if you arrive late/leave early. All students, SI Leaders, and professors should be treated with respect.

**IN-CLASS RECORDINGS:** Students are allowed to record video or audio of class lectures (A class lecture does NOT include assessments (quizzes, tests, exams), SI Sessions, discussion hours, private conversations between students in the class or between a student and the faculty or lecturer during a class session). However, the purposes for which these recordings may be used are strictly controlled.

The only allowable purposes are (1) for personal educational 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 or share recorded lectures without the written consent of the instructor.** 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 lecture 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.

## STUDYING HABITS FOR SUCCESS:

The following habits are critical for success in BCH4024:

- **Attend class in person.** Students who regularly attend class tend to perform significantly better than those that do not attend. Exam material includes slides and what is verbally stated in lecture.
- **Read lecture slides before class.** You will get an idea of what will be covered in class. Also, you will not be overwhelmed by reading the slides for the first time while trying to listen to the lecturer.
- **Review lecture slides & class notes the same day.** On the SAME day as a class, review the lecture slides once again and review the notes you took during class. There is a lot of information in this course, so you want to review a little bit every single day.
- **Go to the professor's discussion hours.** Let us help you! The professors in this course are happy to help clarify concepts during their discussion hours. Additionally, questions asked may help you think about the course information differently. Seek out help early in the semester!
- **Participate in the SI Program.** The SI Program is the most valuable resource for BCH4024. To make the most of your SI session, be sure to attend lecture and review the material BEFORE attending your session. Use Campuswire and Zoom “Walk-In” hours to get questions answered outside of your SI session (or if you are not in a SI group).

- **Teach the material.** Teaching, or verbally explaining concepts, is one of the best ways to learn. Passive studying will not help you understand the material. In this course, you need to know the information AND understand the information so you can apply it to various situations.

## GRADING POLICIES:

### LETTER GRADE CALCULATION:

- Students' final letter grades will be determined based on performance on the syllabus quiz and four (4) exams. Exams will cover the material discussed verbally in the lecture and presented on slides. There is NO EXTRA CREDIT.
- For more information see the BCH4024 Testing and Grading Policies in Canvas. The UF grading policy is available at <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

### TOTAL POINTS:

Assignment	Points (Total = 405)
Syllabus Quiz	5
Exam 1	100
Exam 2	100
Exam 3	100
Exam 4	100

**\*\* There are no cumulative exams.**



**GRADING SCALE:**

*Letter grades will be assigned using the following grading scale. Grade cutoffs will never be raised higher than what is listed below, but the course coordinator may lower the grade cutoffs at their discretion. Any changes will be communicated with students after exams.*

<u>Letter grade</u>	<u>Percent %</u>
A	100 - 90
A-	89.9 - 87
B+	86.9 - 84
B	83.9 - 76
B-	75.9 - 74
C+	73.9 - 70
C	69.9 - 60
C-	59.9 - 56
D+	55.9 - 52
D	51.9 - 49
E	< 49

**LECTURE AND EXAM SCHEDULE:**

<u>Day</u>	<u>Date</u>	<u>Lecturer</u>	<u>Topic</u>
Monday	01/08	DLP	Energy & Thermodynamics (A)
Tuesday	01/09	DLP	Water, pH & Buffers (B)
Wednesday	01/10	DLP	Amino Acids as Protein Building Blocks (C)

Friday	01/12	DLP	Peptides: Bonding, Ionization & Sequencing (D)
<b>Monday</b>	<b>01/15</b>		<b>No Class (Martin Luther King Jr. Day)</b>
Tuesday	01/16	DLP	Interactions Among Amino Acid Side-Chains (E)
Wednesday	01/17	DLP	Understanding Protein Structure (F)
Friday	01/19	DLP	Protein Folding, Unfolding & Misfolding (G)
Monday	01/22	DLP	Protein Binding Interactions: Myoglobin & Hemoglobin (H)
Tuesday	01/23	DLP	Protein Binding Interactions: Myoglobin & Hemoglobin (I)
Wednesday	01/24	DLP	How Enzymes Work (J)
Friday	01/26	DLP	How Enzymes Work (K)
Monday	01/29	DLP	Enzyme Kinetics & Inhibition (L)
Tuesday	01/30	DLP	Basics of Metabolism: Pathways, Regulation and Bioenergetics (M)
Wednesday	01/31	DLP	Digestion and Amino Acid Absorption (N) *End of Exam 1 Material
Friday	02/02	DLP	Mobilization of Amino Acids (O)
Monday	02/05	DLP	Ammonia Assimilation (P)
Tuesday	02/06	DLP	Urea Cycle: Averting Ammonia Toxicity (Q)
<b>Wednesday</b>	<b>02/07</b>	<b>EXAM 1</b>	<b>Begins at 8:20 PM and tests on lectures from 1/8 to 1/31</b>
Friday	02/09	DLP	Biosynthesis of Nonessential & Specialized Amino Acids (R)

Monday	02/12	DLP	Purine Nucleotide Biosynthesis, Degradation & Salvage (T)
Tuesday	02/13	DLP	Pyrimidine Nucleotide Biosynthesis & Ribonucleotide Reductase (S)
Wednesday	02/14	MJA	Lipids
Friday	02/16	MJA	Biological Membranes
Monday	02/19	MJA	Membrane Proteins
Tuesday	02/20	MJA	Membrane Protein Transporters
Wednesday	02/21	MJA	GPCRs
Friday	02/23	MJA	Membrane Protein Signaling
Monday	02/26	MJA	Carbohydrate Structure & Function *End of Exam 2 Material
Tuesday	02/27	MJA	Glycolysis
Wednesday	02/28	MJA	Gluconeogenesis
<b>Thursday</b>	<b>02/29</b>	<b>EXAM 2</b>	<b>Begins at 8:20 PM and tests on lectures from 2/2 to 2/26</b>
Friday	03/01	MJA	Glycogen Metabolism
Monday	03/04	MJA	Cellular Respiration
Tuesday	03/05	MJA	The Citric Acid Cycle
Wednesday	03/06	MJA	Electron Transport

Friday	03/07	MJA	Oxidative Phosphorylation
<b>Mon – Fri</b>	<b>03/11 – 03/15</b>	<b>No Class (Spring Break)</b>	
Monday	03/18	MJA	Introduction to Lipid Metabolism
Tuesday	03/19	MJA	Ketones and Fatty Acid Synthesis
Wednesday	03/20	MJA	Cholesterol Synthesis and Transport
Friday	03/22	MJA	Metabolism Summary
Monday	03/25	LGD	DNA and RNA Structure
Tuesday	03/26	LGD	Genome Organization
Wednesday	03/27	LGD	DNA Replication
Friday	03/29	LGD	DNA Replication *End of Exam 3 Material
Monday	04/01	LGD	Prokaryotic Transcription and Gene Regulation
Tuesday	04/02	LGD	Prokaryotic Transcription and Gene Regulation
Wednesday	04/03	LGD	Eukaryotic Transcription and Gene Regulation
Friday	04/05	LGD	Eukaryotic Transcription and Gene Regulation
<b>Monday</b>	<b>04/08</b>	<b>EXAM 3</b>	<b>Begins at 8:20 PM and tests on lectures from 2/27 to 3/29</b>
Tuesday	04/09	LGD	Eukaryotic Transcription and Gene Regulation
Wednesday	04/10	LGD	Post-Transcriptional RNA Processing

Friday	04/12	LGD	Translation
Monday	04/15	LGD	Translation
Tuesday	04/16	LGD	DNA Damage & Repair
Wednesday	04/17	LGD	DNA Damage & Repair
Friday	04/19	LGD	Molecular Biology Techniques
Monday	04/22	LGD	Cell Cycle Control
Tuesday	04/23	LGD	Cancer Biology
Wednesday	04/24	LGD	Cancer Biology *End of Exam 4 Material
<b>Wednesday</b>	<b>05/01</b>	<b>EXAM 4</b>	<b>Begins at 10:00 AM and tests on lectures from 4/1 to 4/24</b>

## CAMPUS RESOURCES:

### Health and Wellness:

- *U Matter, We Care*: If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto: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](#).

**Academic Resources:**

- *Honorlock technical support*: <https://honorlock.com/support>
- *E-learning technical support*: Contact the [UF Computing Help Desk](#) at 352-392-4357 or via e-mail at [helpdesk@ufl.edu](mailto:helpdesk@ufl.edu).
- [Career Connections Center](#): Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.
- [Library Support](#): Various ways to receive assistance with respect to using the libraries or finding resources.

**Disclaimer:** The professors in the course reserve the right to change the syllabus at any time. This version of the syllabus represents our current plans and objectives. As we go through the semester, those plans may need to change to enhance the class learning opportunity. Such changes, communicated clearly, are not unusual and should be expected. Students are responsible for keeping up with all Canvas and in-person class announcements.