

# BCH4024: INTRODUCTION TO BIOCHEMISTRY & MOLECULAR BIOLOGY

SUMMER 2024 – 4 CREDIT HOURS

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

M/T/W/F 2<sup>ND</sup> PERIOD

**COURSE COORDINATOR:** Mireille J. Aleman, Ph.D., MPH  
[Mireille.aleman@ufl.edu](mailto:Mireille.aleman@ufl.edu)  
ARB R3-291  
352-294-8388 (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.  
ARB R3-126  
[Dlpurich@ufl.edu](mailto:Dlpurich@ufl.edu)

Mireille J. Aleman (“MJA”), Ph.D.  
ARB R3-291  
[Mireille.aleman@ufl.edu](mailto:Mireille.aleman@ufl.edu)

Lauren G. Douma (“LGD”), Ph.D.  
ARB R3-254  
[Lauren.Douma@medicine.ufl.edu](mailto:Lauren.Douma@medicine.ufl.edu) or [Ldouma@ufl.edu](mailto:Ldouma@ufl.edu)

**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. ALEMAN:** Dr. Aleman 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. Aleman” 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 may 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**. **All access course ID: 9dhhjs**

**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 tutoring program for all BCH4024 students. The program is run by SI Leaders, who are trained peers and previously excelled in BCH4024. **We STRONGLY encourage students to participate in the SI Program throughout the semester.** The program offers multiple ways for students to get help in BCH4024:

- **Weekly Group Sessions:** Facilitator-led group study in which a trained peer leads weekly tutoring sessions to review challenging course material through active learning techniques (i.e., practice problems, discussion, Google Jamboards, etc.)
  - During the first week of class, an announcement containing all details regarding SI sign-up will be posted.
  - Sessions will begin the second week of class.
  - Attendance is required to stay in the program.
  
- **Zoom "Walk-In" Tutoring:** Informal live Q&A sessions with trained peers who have been SI Leaders for at least 2 semesters. They can review information with you, go over practice problems, and provide advice on how to tackle the course.
  - No signup is required! Just hop on Zoom at the designated times.
  - Dates and times will be posted on the Canvas homepage.
  - Will begin the second week of class.
  
- **Anonymous Q&A on Campuswire:** Informal asynchronous (not-live) Q&A with trained peers who have been SI Leaders for at least 2 semesters. You can post your questions anonymously to the page, and you are guaranteed a response within 72 hours (but usually sooner). We encourage students to try and answer each other's questions as well! The SI Leaders will monitor the board for answer accuracy.
  - <https://campuswire.com/p/GB1F11E4B>
  - You will need to create Campuswire account using UFL email address (check spam folder for email after registering).
  - Once you have created an account, add the course using course code 9882.
  - Download Campuswire App for Android or iPhone: <https://campuswire.com/download>
  
- **SI YouTube Page:** New videos will be posted each week! These short videos will focus on high-yield topics and/or topics that students tend to have difficulty understanding. Videos from previous semesters are still up on the YouTube page.
  - <https://www.youtube.com/@BCHSIProgram/videos>

**All questions about the SI Program should be directed to the SI Coordinators at**

**[BCH4024.SI@gmail.com](mailto:BCH4024.SI@gmail.com)**

## 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. A total of 27 points will be awarded for attendance, recorded by **iClicker with GPS**. We understand that from time to time, a student may feel unwell or may need to attend a meeting or appointment during class time.

Consequently, students will earn the full 27 attendance points if they attend a minimum of 80% of the scheduled lectures (= 36 days). Please note that 1) attendance to more than 80% of the scheduled lectures will not earn students more than the 27 points awarded for attendance, and 2) attendance to less than 80% of the scheduled lectures will result in loss of points for every additional day a student misses class. These additional absences will not be excused for any reason.

We are working on providing lecture recordings and making them available on Canvas under "Modules" within 24 hours of the lecture. More information will be provided as the technology is rolled out. Students are welcome to record the lectures for personal use (see "In-Class Recordings" under UF Policies section)

**\*\*There are NO Zoom options available, hence only in-person attendance will result in the award of attendance points\*\*.**

How to create an iClicker Student account:

<https://mhe.my.site.com/iclicker/s/article/How-to-Create-an-iClicker-Student-Account>

iClicker course code: <https://join.iclicker.com/FSYM>

### 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): June 6<sup>th</sup>, at 7:00PM
- Exam 2 (100 pts): July 3<sup>rd</sup>, at 7:00PM
- Exam 3 (100 pts): July 25<sup>th</sup>, at 7:00PM
- Exam 4 (100 pts): August 8<sup>th</sup>, at 7:00PM

**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. Those with academic conflicts or religious observations must notify the course coordinator of the conflict at least 1 week before the exam. **Vacations ARE NOT a valid excuse.**

To submit a makeup exam request:

- *First, 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.

**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).

**HONORLOCK POLICIES:** Honorlock proctoring will be used for all exams. This allows you to take the exams in the comfort of your own home while ensuring academic integrity. 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.**
  - Honorlock will provide a scientific calculator for all 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.**

**RESERVING ROOM/WEBCAM:** If you need a room/stable internet/webcam, see the links below. These are all first-come, first-served, so make reservations well in advance of the exam.

You can rent webcams from UF libraries here:

<https://marston.uflib.ufl.edu/services/tech-and-tools/>

You can reserve a testing/study room here (please note some rooms have computers/webcams, some don't): <https://uflib.ufl.edu/using-the-libraries/studyareas>

## 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 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:

- Silence phones before class begins.
- If you want to record the lecture, put your recording device on the stage before class begins.
- Do not talk during lecture. Sound travels very easily in the lecture hall, and everyone can hear conversations, even if you are in the back of the lecture hall. If you need to have a conversation, go outside.
- If you arrive late or leave early, sit towards the back of the auditorium so you do not disturb your classmates. Also, do not let the auditorium doors slam shut.
- Do not pack up your things until class is over. Again, this sound travels very easily in the auditorium, making it difficult for students to hear the professors.
- **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 Course Orientation quiz and four (4) exams. Exams will cover the material discussed verbally in the lecture and presented on slides. None of the exams are cumulative. 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/>

Assignment	Points (Total = 432)
Course Orientation Quiz	5
Attendance	27
Exam 1	100
Exam 2	100
Exam 3	100
Exam 4	100

**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
D-	48.9 - 46
E	< 46

## LECTURE AND EXAM SCHEDULE:

<u>Day</u>	<u>Date</u>	<u>Lecturer</u>	<u>Topic</u>
Monday	05/13	DLP	Energy & Thermodynamics (A)
Tuesday	05/14	DLP	Water, pH & Buffers (B)
Wednesday	05/15	DLP	Amino Acids as Protein Building Blocks (C)
Friday	05/17	DLP	Peptides: Bonding, Ionization & Sequencing (D)
Monday	05/20	DLP	Understanding Protein Structure (E and F)
Tuesday	05/21	DLP	Protein Folding, Unfolding & Misfolding (G)
Wednesday	05/22	DLP	Protein Binding Interactions: Myoglobin & Hemoglobin (H & I)
Friday	05/24	DLP	How Enzymes Work (J & K)
<b>Monday</b>	<b>05/27</b>	<b>No Class – MEMORIAL DAY</b>	
Tuesday	05/28	DLP	Enzyme Kinetics & Inhibition (L)
Wednesday	05/29	DLP	Basics of Metabolism: Pathways, Regulation, and Bioenergetics (M)
Friday	05/31	DLP	Digestion and Amino Acid Absorption (N)
Monday	06/03	DLP	Mobilization of Amino Acids (O)
Tuesday	06/04	DLP	Ammonia Assimilation (P)

<u>Day</u>	<u>Date</u>	<u>Lecturer</u>	<u>Topic</u>
Wednesday	06/05	DLP	Urea Cycle: Averting Ammonia Toxicity (Q)
<b>Thursday</b>	<b>06/06</b>	<b>EXAM 1: Lectures 5/13-5/31</b>	
Friday	06/07	DLP	Biosynthesis of Nonessential & Specialized Amino Acids (R)
Monday	06/10	DLP	Pyrimidine and Purine Nucleotide Biosynthesis (S&T)
Tuesday	06/11	MJA	Lipids and Biological Membranes
Wednesday	06/12	MJA	Membrane Proteins and Transporters
Friday	06/14	MJA	GPCRs
Monday	06/17	MJA	Other Signaling Pathways
Tuesday	06/18	MJA	Carbohydrate Structure & Function
Wednesday	06/19	<b>No Class – Juneteenth</b>	
Friday	06/21	MJA	Glycolysis and the Pentose Phosphate Pathway
Monday	06/24	<b>No Class – Summer Break</b>	
Tuesday	06/25		
Wednesday	06/26		
Friday	06/28		
Monday	07/01	MJA	Gluconeogenesis and Regulation of Opposing Pathways

<u>Day</u>	<u>Date</u>	<u>Lecturer</u>	<u>Topic</u>
Tuesday	07/02	MJA	Glycogen Metabolism and Regulation of Carbohydrate Metabolism
Wednesday	07/03	MJA	The Pyruvate Dehydrogenase Complex and the Citric Acid Cycle
<b>Wednesday</b>	<b>07/03</b>	<b>Exam 2: Lectures 6/03-6/21</b>	
Friday	07/05	MJA	The Electron Transport Chain
Monday	07/08	MJA	Oxidative Phosphorylation
Tuesday	07/09	MJA	Introduction to Lipid Catabolism
Wednesday	07/10	MJA	Ketones and Fatty Acid Synthesis
Friday	07/12	MJA	Cholesterol Synthesis and Plasma Lipoproteins
Monday	07/15	MJA	Metabolism Summary and Review
Tuesday	07/16	LGD	DNA Structure and Genome Organization
Wednesday	07/17	LGD	DNA Replication
Friday	07/19	LGD	DNA Replication
Monday	07/22	LGD	Prokaryotic Transcription and Gene Regulation
Tuesday	07/23	LGD	Prokaryotic Transcription and Gene Regulation
Wednesday	07/24	LGD	Eukaryotic Transcription and Gene Regulation

<u>Day</u>	<u>Date</u>	<u>Lecturer</u>	<u>Topic</u>
Thursday	07/25	<b>Exam 3: Lectures 7/01-7/17</b>	
Friday	07/26	LGD	Eukaryotic Transcription and Gene Regulation
Monday	07/29	LGD	Post-Transcriptional RNA Processing
Tuesday	07/30	LGD	Translation
Wednesday	07/31	LGD	DNA Damage & Repair
Friday	08/02	LGD	Growth Factor Signaling and Cell Cycle Control
<b>Friday</b>	<b>08/02</b>	<b>DROP DEADLINE</b>	
Monday	08/05	LGD	Cancer Biology
Tuesday	08/06	LGD	Cancer Biology
Wednesday	08/07	LGD	Review
Thursday	08/08	<b>Exam 4: Lectures 7/19-8/06</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.