

BCH4024: INTRODUCTION TO BIOCHEMISTRY & MOLECULAR BIOLOGY

FALL 2024 – 4 CREDIT HOURS

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

M/T/W/F 4TH PERIOD (SECTION: 11331) OR 6TH PERIOD (SECTION: 11332)

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
Do NOT your letter to Dr. Douma
Letters must be sent at least 3 business days prior to exam

COURSE INSTRUCTORS: Robert McKenna (“RMK”), Ph.D.
LG-181 McKnight Brain Institute
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Daniel L. Purich (“DLP”), Ph.D.
ARB R3-126
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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 w/ Dr. D” 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: t6885q (4th period) or onuepd (6th period)

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. You are permitted a total of 3 absences.

- **Biweekly Zoom “Deeper Dives” on Difficult Subjects:** Informal live review and 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 sign-up is required! Just hop on Zoom at the designated times.
 - Dates and times will be posted on Canvas under Zoom Conferences.

- **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/G4CDBC230>
 - 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 6780.
 - Download Campuswire App for Android or iPhone: <https://campuswire.com/download>

- **SI YouTube Page:** Short videos will focus on high-yield topics and/or topics that students tend to have difficulty understanding.
 - <https://www.youtube.com/@BCHSIProgram/videos>

**All questions about the SI Program should be directed to the SI Coordinators at
BCH4024.SI@gmail.com**

COURSE POLICIES:

PARTICIPATION REQUIRED: Students will use free access to iClicker Cloud to submit responses to formative feedback questions during the lecture listed on their class registration. iClicker GPS requires you to be physically present in the lecture hall to answer questions. Students caught trying to answer any iClicker question without being physically present in the classroom are in direct violation with the honor code and will be reported.

Students who participate in ALL questions during a lecture will receive all participation points for that day. If a student does not participate in **ALL** questions during a lecture, they will not receive any participation points. Points will be awarded based on participation, not accuracy, but students must put an appropriate answer (i.e., if the professor asks for a number answer and a student puts a letter or word, they will not receive credit).

Participation in 80% of the lecture days will result in a student earning all possible participation points. The 20% buffer days are for unexpected emergencies, illness, hurricane days, technical issues, no internet connection, missed iClicker questions, academic travel, etc. Students should only miss class for emergencies. **If a student uses up their 20% buffer and misses additional lectures, they will begin losing points on their participation grade.** No exceptions will be made for any reason, regardless of documentation.

To receive credit for your responses, your iClicker account must be linked to Canvas. iClicker grades will be synced with Canvas every week. If you do not see iClicker participation scores in Canvas grades, then you have not completed the sync successfully and it is your responsibility to contact iClicker support and have it fixed before the last day of class.

iClicker Login Instructions: [click here](#)

iClicker Support: <https://mhe.my.site.com/iclicker/s/contactsupport>

LECTURE RECORDINGS:

Lectures will be recorded and available on Canvas under “Modules” within 24 hours of the lecture. If technical issues arise and there is an issue with the lecture recording, students are still responsible for knowing all the information in that lecture for exams.

THERE IS NO ZOOM OPTION, AND STUDENTS CANNOT JOIN REMOTELY

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, September 18 at 8:20 PM
- Exam 2 (100 pts): Monday, October 14 at 8:20 PM
- Exam 3 (100 pts): Thursday, November 7 at 8:20 PM
- Exam 4 (100 pts): Monday, December 9 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. 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).

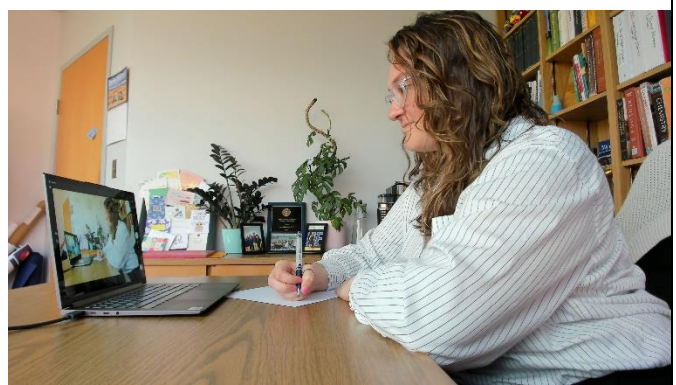
HONORLOCK POLICIES:

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. Your camera view must match one of the following images:



Option 1: Internal camera setup to show scratch paper up to head. If you cannot get this view with your internal camera, you MUST use an external camera (option 2).



Option 2: Place an external camera off to your side so we can see your scratch paper up to your head. We must see what you are looking at.

- Your eyes must remain on your scratch paper or computer screen.
- 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.
- 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) 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 reviews 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, class participation measured by GPS-enabled iClicker, and four (4) multiple-choice 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	% of Grade
Course Orientation Quiz (Due 9/6 at 11:59 PM – no extensions)	2%
iClicker Participation (Must participate in 80% of classes for all points)	6%
Exam 1 (50 multiple-choice questions; 100 points total)	23%
Exam 2 (50 multiple-choice questions; 100 points total)	23%
Exam 3 (50 multiple-choice questions; 100 points total)	23%
Exam 4 (50 multiple-choice questions; 100 points total)	23%

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. Students should assume that there will be no adjustments to the grade scale.*

<u>Letter grade</u>	<u>Percent %</u>
A	100 - 92
A-	91.9 - 90
B+	89.9 - 87
B	86.9 - 83
B-	82.9 - 80
C+	79.9 - 77
C	76.9 - 70
C-	69.9 - 67
D+	66.9 - 63
D	62.9 - 60
D-	59.9 - 57
E	< 57

LECTURE AND EXAM SCHEDULE:

* = DATES WILL BE USED AS BACKUP LECTURE DAYS IF NEEDED (I.E., HURRICANE DAYS).

<u>Day</u>	<u>Date</u>	<u>Lecturer</u>	<u>Topic</u>
Friday	8/23	LGD/RMK	Course Introduction/Biological Organization
Monday	8/26	RMK	Water, Molecular Interactions, and Acid-Base Chemistry
Tuesday	8/27	RMK	Amino Acids
Wednesday	8/28	RMK	Peptides and Peptide Bonds
Friday	8/30	RMK	Three-Dimensional Structure of Proteins
Monday	9/2	No Class – Labor Day	
Tuesday	9/3	RMK	Protein Dynamics and Protein Folding
Wednesday	9/4	RMK	Protein Separation and Purification
Friday	9/6	RMK	Protein-Ligand Interactions (COURSE INFO QUIZ DUE)
Monday	9/9	RMK	Enzyme Mechanism and Catalysis I
Tuesday	9/10	RMK	Enzyme Mechanism and Catalysis II
Wednesday	9/11	RMK	Enzyme Kinetics and Inhibition
Friday	9/13	RMK	Enzyme Regulation and Bioenergetics
Monday	9/16	DLP	Digestion and Amino Acid Absorption

Tuesday	9/17	DLP	Mobilization of Amino Acids
Wednesday	9/18	Exam 1 (Lectures 8/23 to 9/13) at 8:20 PM (No class*)	
Friday	9/20	DLP	Ammonia Assimilation
Monday	9/23	DLP	Urea Cycle: Averting Ammonia Toxicity
Tuesday	9/24	DLP	Biosynthesis of Nonessential & Specialized Amino Acids
Wednesday	9/25	DLP	Pyrimidine Nucleotide Biosynthesis & Ribonucleotide Reductase
Friday	9/27	DLP	Purine Nucleotide Biosynthesis, Degradation & Salvage
Monday	9/30	MJA	Lipids
Tuesday	10/1	MJA	Biological Membranes
Wednesday	10/2	MJA	Membrane Proteins
Friday	10/4	MJA	Membrane Protein Transporters
Monday	10/7	MJA	GPCRs
Tuesday	10/8	MJA	Membrane Protein Signaling
Wednesday	10/9	MJA	Carbohydrates Structure & Function
Friday	10/11	MJA	Glycolysis
Monday	10/14	Exam 2 (Lectures 9/16 to 10/8) at 8:20 PM (No class*)	
Tuesday	10/15	MJA	Gluconeogenesis

Wednesday	10/16	MJA	Glycogen Metabolism
Friday	10/18	No Class – Homecoming	
Monday	10/21	MJA	Cellular Respiration
Tuesday	10/22	MJA	The Citric Acid Cycle
Wednesday	10/23	MJA	Electron Transport
Friday	10/25	MJA	Oxidative Phosphorylation
Monday	10/28	MJA	Introduction to Lipid Metabolism
Tuesday	10/29	MJA	Ketones and Fatty Acid Synthesis
Wednesday	10/30	MJA	Cholesterol Synthesis and Transport
Friday	11/1	MJA	Metabolism Summary
Monday	11/4	LGD	DNA Structure & Genome Organization
Tuesday	11/5	LGD	DNA Replication
Wednesday	11/6	LGD	DNA Replication
Thursday	11/7	Exam 3 (Lectures 10/9 to 11/1) at 8:20 PM	
Friday	11/8	LGD	Prokaryotic Transcription and Gene Regulation
Monday	11/11	No Class – Veteran’s Day Observed	
Tuesday	11/12	LGD	Prokaryotic Transcription and Gene Regulation

Wednesday	11/13	LGD	Eukaryotic Transcription and Gene Regulation
Friday	11/15	LGD	Eukaryotic Transcription and Gene Regulation
Monday	11/18	LGD	Post-Transcriptional RNA Processing
Tuesday	11/19	LGD	Translation
Wednesday	11/20	LGD	Translation
Friday	11/22	LGD	DNA Damage & Repair (DROP DEADLINE at 11:59 PM)
Monday	11/25	No Class – Thanksgiving Break	
Tuesday	11/26		
Wednesday	11/27		
Friday	11/29		
Monday	12/2	LGD	Growth Factor Signaling & Cell Cycle Control
Tuesday	12/3	LGD	Cancer Biology
Wednesday	12/4	LGD	Cancer Biology
Monday	12/9	Exam 4 (Lectures 11/4 to 12/4) at 10:00 AM	

CAMPUS RESOURCES:

Health and Wellness:

- *U Matter, We Care*: If you or someone you know is in distress, please contact 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.
- [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.