

Molecular Biology and Biochemistry

694:407/115:511

Fall 2023

Instructors and Contact Information

Instructor	Email	Office Location & Student Support Hours
Kevin Monahan (coordinator)	km1339@dls.rutgers.edu	Nelson A317 - TBD
Gabe Villegas	villegas@dls.rutgers.edu	Nelson A311 - TBD

You can expect us to reply to emails within 1 business day, not including weekends or holidays. Often we will reply within a few hours.

Course Information

- Lectures will be held in-person on Mondays and Thursdays from 10:20 to 11:40 AM in the Science & Engineering Resource Center, Room 111 (SEC-111) [\[room information\]](#), on the Busch campus. [\[map\]](#)
- All grades and assignments will be posted on Canvas. Our course site is: <https://rutgers.instructure.com/courses/239401>

Course Description

This course is the first semester of a two-semester sequence offered as the primary foundation course for students interested in pursuing modern molecular biology. The first semester (01:694:407) presents a complete survey of Biochemistry topics, and the second semester (01:694:408) provides a thorough coverage of current ideas in Molecular Biology.

Prerequisites

Organic Chemistry 01:160:209 or 01:160:307 or higher. Credit not given for both 01:694:407 and 01:694:301, 11:115:301 or 11:115:403.

Learning Goals

1. Students should demonstrate an understanding of the knowledge that is needed to begin biomedical research and that is required for post-graduate exams and studies.
2. Students should demonstrate the ability to find and evaluate information about specific biological systems or problems.
3. Students will understand how energy is derived from fuels in biological systems
4. Students should demonstrate the ability to link together the different metabolic processes and understand how they regulate each other and function cooperatively
5. Students will understand how genetic information is propagated, maintained, and utilized to facilitate biological functions
6. Students will understand how cells are able to regulate the import and export of biomolecules, why this occurs, and how

Required Text

Principles of Biochemistry 8th Ed., Lehninger, Nelson & Cox - ISBN: 9781319230906 (Achieve Access Code)

All students in the class will be automatically enrolled in the First Day program from MacMillan, which provides the eBook version of the textbook. First Day also includes access to the MacMillan Achieve site, where you can find optional course resources such as practice problem sets. You can opt-out of the First Day program if you'd prefer to get the textbook in another way, but you will also lose access to Achieve.

Assignments

Exams will account for 90% of your final grade. The four exams will count equally, so each will account for 22.5% of your final grade. The remaining 10% of your final grade will be made up of weekly online quizzes delivered on Canvas.

Exams

There will be four exams covering blocks of material as indicated on the syllabus. The exams will primarily test the material covered in each block, but you will also be expected to retain the core concepts covered earlier in the course. Exams will be administered in-person during class time, with the exception of the fourth exam, which will be given during the final exam period but is otherwise a normal exam. Exams will consist primarily of multiple choice and fill in the blank questions, but will also include a limited number of open-ended questions.

Quizzes

Most weeks there will be a quiz assigned on Canvas, which will be due on Sunday at 11:59pm. Late quizzes will not be accepted. These quizzes will not be timed and will not require Lockdown Browser. You should take the quizzes after attending lecture; they are intended to increase your understanding and retention. You should work independently, but you may use your notes and textbook to answer the questions. The quizzes will not all be worth the same amounts of points; your final quiz grade will be calculated by adding together the points you received on each quiz and then dividing by the total number of quiz points available.

Homework

There is no graded homework component for this course. Practice problems can be found in the textbook and through Achieve.

Extra credit

Extra credit MAY be assigned during the semester at the discretion of the teaching staff. Any extra credit opportunities will be presented to the class as a whole. Extra credit points will be awarded as extra points on the 4th exam. **NO EXTRA CREDIT WILL BE ASSIGNED AFTER THE 4TH EXAM.**

Grading Policy

After each exam, we will send the class relevant details about class averages including mean, median and distribution. We will not, under any circumstances, answer questions regarding grade cutoffs. We will not be calculating grade cutoffs until after the final exam. If a curve is required, it will be determined at the end of the semester.

If you notice a possible mistake after your quiz or exam is graded, please let us know right away. Grading related questions must be asked within one week of receiving your graded assignment. After one week has passed, exam and quiz grades will be locked; this prevents a tsunami of regrade requests during the last week of the semester. If we do find a mistake in grading, we will fix the error and update grades on Canvas accordingly.

Final grades will be rounded to the nearest whole number. For example, 89.50 will round up to a 90. An 89.49 will round down to an 89.

Attendance and Makeup Policy

Students are expected to attend all lectures in-person. Contact the instructor in advance if you expect to be absent frequently or to miss multiple lectures in a row. If you do miss a lecture, please use the University self-reporting absence system (<https://sims.rutgers.edu/ssra/>) to record your absence. When possible, we will make lecture recordings (from this year or prior years) available to students who report an absence.

It is your responsibility to let the course coordinator know beforehand if and why you are unable to take an exam at its scheduled time. Acceptable reasons include things like illness and emergency situations; trips or travel are not a valid excuse. In the case of an exam missed due to illness, please contact the dean of students (deanofstudents@echo.rutgers.edu) and obtain a note. No penalty will be given if an exam is missed for acceptable reasons, and we will make reasonable accommodations to allow you to take a makeup exam. If you miss an exam without making arrangements in advance, you have 24 hours after the exam to contact the coordinator to arrange a makeup. If no previous acceptable excuse exists for missing the exam, a fifteen (15) point penalty will be applied to your exam score and the makeup must take place no more than 72 hours after the exam date. **No makeups will be given for the final exam except when required by the dean's office.**

Course Schedule

Week	Date	Lecture #	Lecturer	Topic	Chapter
1	9/7/2023	1	Villegas	Foundations of Biochemistry	1
2	9/11/2023	2	Villegas	Water (pH and buffers)	2
	9/14/2023	3	Villegas	Amino Acids, Peptides & Proteins	3
3	9/18/2023	4	Villegas	Proteins, Methods & Bioinformatics	3
	9/21/2023	5	Villegas	Protein Structure	4
4	9/25/2023	6	Villegas	Protein Function	5
	9/28/2023	7	Villegas	Enzymes	6
5	10/2/2023			EXAM 1	
	10/5/2023	8	Villegas	Carbohydrates	7
6	10/9/2023	9	Villegas	Nucleotides & Nucleic Acids	8
	10/12/2023	10	Villegas	Lipids	10
7	10/16/2023	11	Villegas	Membrane Transport	11
	10/19/2023	12	Villegas	Protein Turnover	12
8	10/23/2023			EXAM 2	
	10/26/2023	13	Monahan	Introduction to Metabolism	13
9	10/30/2023	14	Monahan	Glycolysis	14.1-14.3
	11/2/2023	15	Monahan	Gluconeogenesis & Pentose Phosphate Pathway	14.4-14.6
10	11/6/2023	16	Monahan	Glucose and Glycogen	15
	11/9/2023	17	Monahan	Citric Acid Cycle	16
11	11/13/2023	18	Monahan	Lipid Metabolism (catabolism, ketogenesis)	17
	11/16/2023	19	Monahan	Amino Acid Catabolism & Urea Cycle	18
12	11/20/2023			EXAM 3	
	11/21/2023	20	Monahan	Electron Transport Chain, Oxidative Phosphorylation	19.1 - 19.2
13	11/27/2023	21	Monahan	Oxidative Phosphorylation and Photosynthesis Part 1	19.2-19.5 20.1-20.3
	11/30/2023	22	Monahan	Photosynthesis Part 2	20.4-20.6
14	12/4/2023	23	Monahan	Lipid Biosynthesis	21
	12/7/2023	24	Monahan	Amino Acid Biosynthesis	22.1 -22.3
15	12/11/2023	25	Monahan	Nucleotide Metabolism	22.4
FINALS	TBD			TBD	

Exam Schedule

Date	Subject
10/2	Lectures 1-7 covering Chapters 1-6
10/23	Lectures 8-12 covering Chapters 7, 8, 10-12
11/20	Lectures 13-19 covering Chapters 13-18
TBD	Lectures 20-25 covering Chapters 19-22

Academic Integrity Policy

Students are expected to be familiar with Rutgers' Code of Academic Integrity ([Found Here](#)) and the possible penalties (including suspension and expulsion) for violating the policy. Academic dishonesty includes (but is not limited to):

- Cheating
- Plagiarism
- Aiding others in committing a violation or allowing others to use your work
- Failure to cite sources correctly, including artificial intelligence based tools
- Fabrication
- Using another person's ideas or words without attribution, including re-using a previous assignment
- Unauthorized collaboration
- Sabotaging another student's work

We have a zero-tolerance policy for cheating, and all violations will result in substantial penalties. If you have any doubts or questions about what constitutes academic misconduct, please do not hesitate to contact Dr. Monahan.

Disability Accommodations

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation (<https://ods.rutgers.edu/students/documentation-guidelines>). If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at:

<https://ods.rutgers.edu/students/registration-form>

For more information, please contact the office of disability services:

Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ

<https://ods.rutgers.edu/>

(848) 445-6800

Student Support and Mental Wellness Services

Counseling, ADAP & Psychiatric Services (CAPS)

(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901

<http://health.rutgers.edu/medical-counseling-services/counseling/>

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professionals within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community, and consultation and collaboration with campus partners.

Crisis Intervention: <http://health.rutgers.edu/medical-counseling-services/counseling/crisis-intervention/>

Report a Concern: <http://health.rutgers.edu/do-something-to-help/>

Violence Prevention & Victim Assistance (VPVA)

(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901

www.vpva.rutgers.edu/

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Disability Services

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Additional Services

- Student Success Essentials: <https://success.rutgers.edu>
- Student Support Services: <https://www.rutgers.edu/academics/student-support>
- The Learning Centers: <https://rlc.rutgers.edu/>
- Rutgers Libraries: <https://www.libraries.rutgers.edu/>
- Bias Incident Reporting: <https://studentaffairs.rutgers.edu/bias-incident-reporting>
- Office of Veteran and Military Programs and Services: <https://veterans.rutgers.edu>