RUTGERS

Molecular Biology and Biochemistry 694:408/115:512

Tuesdays and Thursdays
3.50 - 5.10 P.M.
TIL-254 (Livingston Campus)
Coordinator: Dr. Samuel Bunting

Syllabus
Spring 2023

Instructors	Phone	Office Hours	Office
Dr. Sam Bunting (Lectures 1-12)	848-445-9894	By appt.	337 CABM
Dr. Sam Gunderson (Lectures 13-25)	848-445-1016	By appt.	A322 Nelson

Lec#		Date	Topic	Instructor	Readings Watson 7thEd Chp:pgs.
1	Tu	Jan 17	DNA Structure	Dr. Bunting	4: 77-92
2	Th	Jan 19	DNA Replication Proteins – Structure, Function & In-vitro activities		9: 257-278
3	Tu	Jan 24	Regulation of DNA Topology - Prokaryotic and Eukaryotic DNA topoisomerases		4: 93-103 8:220-222 2: 21-30
4	Th	Jan 26	Prokaryotic DNA Replication		9: 278-296
5	Tu	Jan 31	Eukaryotic DNA Replication		9: 296-311
6	Th	Feb 2	Recombinant DNA 1		7: 147-168
E1	**Tu**	**Feb 7**	**Exam 1 (Covers Lectures 1-6)**		
7	Th	Feb 9	Recombinant DNA 2		7: 147-168
8	Tu	Feb 14	DNA Damage & Mutability		10: 313-324
9	Th	Feb 16	DNA Repair		10: 324-338
10	Tu	Feb 21	Homologous & Site-specific Recombination		11: 341-375
11	Th	Feb 23	DNA Transposition and Ig Gene Rearrangement		12: 377-420
12	Tu	Feb 28	Genome Structure and Chromatin		8: 199-255
E2	**Th**	**Mar 2**	**Exam 2 (Covers Lectures 7-12)**		
13	Tu	Mar 7	Basic Mechanisms of Transcription	Dr. Gunderson	13:429-462
14	Th	Mar 9	Transcriptional Regulation in Bacteria		18:615-635

Sat, Mar 11 - Sun, Mar 19 **Spring Break**

Molecular Biology and Biochemistry 694:408/115:512

Lec#	Date	Topic	Instructor	Readings Watson 7thEd Chp:pgs.
15	Tu Mar 21	Transcriptional Regulation in Bacteria and Phage	Dr. Gunderson	18:636-652
16	Th Mar 23	Methods in Molecular Biology and Biochemistry		7:168-190
17	Tu Mar 28	Transcriptional Regulation in Eukaryotes 1		13: 462-464 19: 657-686
18	Th Mar 30	Transcriptional Regulation in Eukaryotes 2		19: 687-698
E3	**Tu Apr 4**	**Exam 3 (Covers Lectures 13-18)**		
19	Th Apr 6	Post-transcriptional Control: Splicing & Polyadenylation		5:107-118 14:467-506‡
20	Tu Apr 11	Post-transcriptional Control: Splicing & Polyadenylation (cont)		14:467-506‡
21	Th Apr 13	Post-transcriptional Control: Splicing & Polyadenylation (cont)		14:467-506‡
22	Tu Apr 18	RNA World, Ribozymes, RNA Splicing		14:467-506‡ 20:701-731
23	Th Apr 20	Control of mRNA Translation, Stability, Localization		20:701-731
24	Tu Apr 25	Translation: Bacterial & Eukaryotic		15:509-544‡ 16:573-590
25	Th Apr 27	Translation: Bacterial & Eukaryotic		15:509-544‡ 16:573-590
E4	**Fr May 5-11**	**Final Exam 4 (Covers Lectures 19-25) Exact date TBD**		

Molecular Biology and Biochemistry 694:408/115:512

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 should demonstrate the ability to design experiments and critically analyze data.

Course website: Canvas

Lectures will be offered in-person at TIL-254. Instructors will be available after class to answer students' questions.

Office hours are by appointment. Please email to set up a time.
Dr. Bunting - **bunting@cabm.rutgers.edu**
Dr. Gunderson - **gunderson@dls.rutgers.edu**

Required Supplies:
1. Textbook: Watson, J.D., et al. (2014) Molecular Biology of the Gene, 7th Ed., Pearson. (ISBN: 9780321762436)
‡Supplementary readings will be provided and posted on Canvas.

Course Structure and Requirements:

694:408 Grades will have two components:

1. Exams (100%): Four examinations of equal weight will be given on the indicated dates. Exam questions will consists of multiple choice, multiple answer, calculation and short answer responses. Exams will be administered in-person only.

Students who miss an exam will have 24 hours after the exam due date to contact the coordinator to arrange a makeup. If an exam is missed because of illness, a makeup exam will be available if supporting documentation is provided from a physician. Makeup exams may occasionally also be scheduled by prior arrangement with the coordinator in case of extraordinary events. If no previous arrangement has been made or documentation provided, then a fifteen (15) point penalty will be applied. Any makeup is to take place within 72 hours of the exam due date.

2. Extra credit for submitting online course survey to CTAAR (+0.25%). Submit your anonymous course survey, also known as SIRS, during the last week of class and upload a screenshot of your receipt through Canvas to obtain extra credit. More information on how to obtain and submit the receipt will be provided when the survey opens.

115: 512 Grades will have a second component to their Exam grade:
3. Term paper (7.5% of Exam Grade): Graduate students will submit a 1000-word term paper on a current topic in molecular biology. Topics will be assigned and submitted through Canvas no later than 5 PM April 23, 2023.

All exams are closed book. All four examinations will be averaged and weighted equally in assigning final grades. In the rare case that you suspect an exam question has not been accurately graded, a request for re-grading will be considered WITHIN ONE WEEK AFTER EXAM PAPERS HAVE BEEN RETURNED. In such cases, the entire exam will be regraded so that points may be added or subtracted as appropriate.

Disability
Students with disabilities who require accommodation must follow the procedures outlined by the Office of Disability Services (https://ods.rutgers.edu).

Academic Integrity Policy: Students are expected to follow the Rutgers Academic Integrity Code. When required of graduate students, written work is also subject to this policy. Violations include: cheating, fabrication, plagiarism, denying others access to information or material, and facilitating violations of academic integrity. It is not permitted for students to share information about exam questions or answers during an assessment period, and there will be zero tolerance in cases where this occurs. Students caught cheating will get a zero for the exam and the Dean's office will be notified.

Student-Wellness Services:

Just In Case Web App
http://codu.co/cee05e
Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

Counseling, ADAP & Psychiatric Services (CAPS)
(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/ rhscaps.rutgers.edu/
CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional 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.

Violence Prevention & Victim Assistance (VPVA)
(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / 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
(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / https://ods.rutgers.edu/
The Office of Disability Services works with students with a documented disability to determine the eligibility of reasonable accommodations, facilitates and coordinates those accommodations when applicable, and lastly engages with the Rutgers community at large to provide and connect students to appropriate resources.

Scarlet Listeners
(732) 247-5555 / http://www.scarletlisteners.com/
Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.