BIOL 45: Molecular Biology
Summer 2024

Professor
Natasha Grotz

Class Meetings
LSC 104
10A: T/Th 10:10am-12pm, F 3:30-4:20pm

Office Hours
Office hours are by appointment; please e-mail me to schedule.

Textbook
There is not a required textbook for the course. However, if you would like to look at associated readings, I have provided page numbers from *Molecular Biology of the Gene, 7th ed.* by James Watson *et al.*

Assessment
Reflections: 4%
Participation: 3%
Problem Sets: 60%
Paper Assignment: 2%
Final Assignment: 31%

Participation: Participation is a measure of your overall engagement with the class; it can take many forms including, but not limited to, attending class, asking thoughtful questions, willingly offering answers to questions, and actively working with the material.
Reflections: Administered through Canvas during the first two parts of the course, you will be asked to summarize important/interesting points from class and to ask questions you may have.
Problem Sets: For the first two parts of the course, there are associated in-class problem sets.
Paper Assignment: You will be given a primary literature article to read and an associated brief assignment.
Final Paper Assignment: You will be given a primary literature article to read and an associated assignment.

Canvas
The Canvas site for the course will contain PowerPoint slides used during lecture as well as other relevant materials.

Honor Principle
In all work pertaining to this course, students are expected to obey the Honor Principle (https://policies.dartmouth.edu/about/academic-honor-principle, https://policies.dartmouth.edu/policy/academic-honor-policy-undergraduate-students-arts-and-sciences). Unless otherwise stated, assignments are to be performed and written independently.

Any external sources used in preparing assignments are to be formally cited. Appropriate outside resources include original research articles, reviews, articles, textbooks, or personal communication with researchers. Regarding the use of AI in the course, please see below. In addition to putting a list of references at the end of any assignments, you need to note the author, year within your text whenever you use a reference. For more information, please see https://writing.dartmouth.edu/support/sources-and-citations.

If you have questions about how the Honor Principle applies to any aspect of this course, please do not hesitate to contact me.

AI

Although using an AI-content generator such as ChatGPT can be a useful way to learn more about specific aspects of molecular biology, the use of an AI-content generator to complete assignments in this course is prohibited. In other words, although you may choose to use these systems to learn more about a technique, for example, you may not ask these systems to directly provide answers to assignments you are submitting. Further, learning more through these systems is only a first step. You are expected to confirm what you have learned using other sources such as textbooks, primary literature articles and reviews, and, perhaps, scientific company pamphlets or websites, and you are responsible for citing sources used, including the use of AI-content generators.

Socioeconomic Differences and Financial Difficulty

Our community is composed of students from a variety of financial backgrounds. Socioeconomic diversity can be invisible, and you may be experiencing financial difficulties related to the cost of textbooks, materials, or other necessities for our class of which I am not aware.

If you encounter financial challenges related to this class, there may be sources of support for you. If you feel comfortable sharing your experience with me, you may. You may also consider meeting with a financial aid officer to discuss options, reaching out to the First-Generation Office if you are a first-generation student, browsing the *Funding Resources* page, or, for unexpected expenses, applying to the Barrier Removal Fund through the Financial Aid tile in *DartHub*.

Student Accessibility and Accommodations

Students requesting disability-related accommodations and services for this course are required to register with Student Accessibility Services (SAS; Apply for Services webpage; student.accessibility.services@dartmouth.edu; 1-603-646-9900) and to request that an accommodation email be sent to me in advance of the need for an accommodation. Then, students should schedule a follow-up meeting with me to determine relevant details such as what role SAS or its Testing Center may play in accommodation implementation. This process works best for everyone when completed as early in the quarter as possible. If students have questions about whether they are eligible for accommodations or have concerns about the implementation of their accommodations, they should contact the SAS office. All inquiries and discussions will remain confidential.

Attendance
You are expected to attend class in person; however, there may be times when you need to miss class due to emergent circumstances like illness or other medical reasons, family emergencies, etc. If you are unable to attend class, please reach out to me as soon as possible. If needed, I will work with you and your dean to chart the best path forward. While alternative arrangements may be made, this path may also include a recommended incomplete, course withdrawal, or withdrawal from the term.

COVID-19
For information regarding COVID-19 guidance and resources, please see https://covid.dartmouth.edu/home.

Religious Observances
Dartmouth has a deep commitment to support students' religious observances and diverse faith practices. Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in the course, please meet with me as soon as possible—before the end of the second week of the term at the latest—to discuss appropriate course adjustments.

Note About Health
The academic environment is challenging, our terms are intensive, and classes are not the only demanding part of your life. There are a number of resources available to you on campus to support your wellness, including: the *Counseling Center* which allows you to book triage appointments online, the *Student Wellness Center* which offers wellness check-ins, and your *undergraduate dean*. The student-led *Dartmouth Student Mental Health Union* and their peer support program may be helpful if you would like to speak to a trained fellow student support listener. If you need immediate assistance, please contact the counselor on-call at (603) 646-9442 at any time. Please make me aware of anything that will hinder your success in this course.

Sexual Misconduct and Title IX
At Dartmouth, we value integrity, responsibility, and respect for the rights and interests of others, all central to our Principles of Community. We are dedicated to establishing and maintaining a safe and inclusive campus where all community members have equal access to Dartmouth's educational and employment opportunities. We strive to promote an environment of sexual respect, safety, and well-being. Through the Sexual and Gender-Based Misconduct Policy (SMP), Dartmouth demonstrates that sex and gender-based discrimination, sex and gender-based harassment, sexual assault, dating violence, domestic violence, stalking, etc., are not tolerated in our community.

For more information regarding Title IX and to access helpful resources, visit Title IX's website (sexual-respect.dartmouth.edu). As a faculty member, I am required to share disclosures of sexual or gender-based misconduct with the Title IX office.

If you have any questions or want to explore support and assistance, please contact the Title IX office at 603-646-0922 or TitleIX@dartmouth.edu. Speaking to Title IX does not automatically

initiate a college resolution. Instead, much of their work is around providing supportive measures to ensure you can continue to engage in Dartmouth's programs and activities.

Consent to Record

(1) Consent to recording of course meetings and office hours that are open to multiple students. By enrolling in this course,

a) I affirm my understanding that the instructor may record meetings of this course and any associated meetings open to multiple students and the instructor, including but not limited to scheduled and ad hoc office hours and other consultations, within any digital platform, including those used to offer remote instruction for this course.

b) I further affirm that the instructor owns the copyright to their instructional materials, of which these recordings constitute a part, and my distribution of any of these recordings in whole or in part to any person or entity other than other members of the class without prior written consent of the instructor may be subject to discipline by Dartmouth up to and including separation from Dartmouth.

(2) Requirement of consent to one-on-one recordings

By enrolling in this course, I hereby affirm that I will not make a recording in any medium of any one-on-one meeting with the instructor or another member of the class or group of members of the class without obtaining the prior written consent of all those participating, and I understand that if I violate this prohibition, I will be subject to discipline by Dartmouth up to and including separation from Dartmouth, as well as any other civil or criminal penalties under applicable law. I understand that an exception to this consent applies to accommodations approved by SAS for a student's disability, and that one or more students in a class may record class lectures, discussions, lab sessions, and review sessions and take pictures of essential information, and/or be provided class notes for personal study use only.

If you have questions, please contact the Office of the Dean of the Faculty of Arts and Sciences.

Course Schedule

6/20	Introduction, Nucleic Acids and Protein Chemistry	pp 24-25, 32-33, 77-89, Ch 3, pp 121-129
6/25	Protein Chemistry problems/DNA Replication	Ch 9
6/27	DNA Replication problems/DNA Mutagenesis and Repair	Ch 10
7/2	DNA Damage and Repair problems/Bacterial Transcription and Gene Control	pp 429-447, 615-630
7/4	No Class	
7/9	Bacterial Transcription and Gene Control problems/ Bacteriophage λ	pp 636-651
7/11	Bacteriophage λ problems	
7/16	Problem Set 1 (**Nucleic Acids through Bacteriophage λ**)	
7/18	Eukaryotic Transcription and Eukaryotic Gene Regulation	pp 448-454, 657-686
7/23	Eukaryotic Transcription and Gene Regulation problems/Chromatin	pp 220-249, 687-693
7/25	Chromatin problems/RNA Processing and RNA Silencing	pp 455-462, 467-477, 481-486, 491-494, 711-727
7/30	RNA Processing and RNA Silencing problems/Translation	Ch 15
8/1	Translation problems/Site Specific Recombination and Transposons/Site Specific Recombination and Transposons problems	Ch 12
8/6	Problem Set 2	
8/8	Paper Discussion	
8/13	Paper Discussion/Paper Assignment Due	
8/15	Paper Discussion	
8/20	Paper Discussion/Final Assignment Due	