

Hamilton College
Genes, Molecules and Cells Lab
BIO211L-01, 02
Fall 2025

Professor: Nicole L. McDaniels, Ph.D.

Email: nmcdanie@hamilton.edu

Phone: 315-859-4455

Office: SCCT 2071

Office Hours: Tuesday 1-2pm and Wednesday 11am-12pm

Lab: SCCT 2089

Lab Hours: Section 01- Wednesday 1-4pm

Section 02- Thursday 1-4pm

Course Description:

An intermediate course that examines genetics and biochemistry within the context of the cell. This course will focus on the macromolecules of life, genetic material and classical genetics, fundamental biochemical pathways, and cellular structure and function. A particular focus will be placed on proteins and nucleic acids and how cells use these molecules to direct the mechanisms of inheritance, energy production, and cellular reproduction. In lab, we will learn and practice the tools and techniques used to study molecules, cells, and genetics.

Goals:

The lab section of BIO211L is designed to help connect concepts and content from lecture with the practice of laboratory research related to the study of genes, molecules, and cells. In lab you will learn common experimental techniques, tools and skills used to study genes, molecules, and cells while building a foundation for upper-level biology labs at Hamilton. This lab emphasizes two of the eight education and curriculum goals laid out by Hamilton College

(www.hamilton.edu/academics/catalogue/educational-goals-and-curriculum):

- 1) *Analytic Discernment:* We will analyze quantitative and symbolic information to identify patterns and connections across foundational concepts in the study of molecular and cellular biology and genetics.
- 2) *Disciplinary Practice:* We will learn tools, techniques and methodologies for studying genetics, molecular and cellular biology. Students will work to master basic lab skills as well as learn cutting-edge techniques used in current scientific research.

Materials

- Lab coat (shared coats are available in the lab or you may bring your own)
- Composition Notebook (supplied)

Grading

One combined final grade for both BIO211 lecture and lab will be awarded. The laboratory grade will constitute 30% of the BIO211 grade. Points awarded for the lab section are:

Assessment	Points
Pre-labs (10 of 11 at 5 points each)	50
Participation (10 of 12 at 5 points each)	50
Notebook Checks (10 at 11 at 5 points each)	50
Enzymes Post Lab	25
PTC Post Lab	25
Milk Mini Lab Report	50
Covid-19 Lab Report	100
3D Printing Project	100
Total	450

Class Policies

- Attend each lab session. Arrive early and prepared to learn. Attendance will be taken and will constitute a part (but not all) of your Participation grade.
- **Missing more than five lab sessions without documentation will result in a failing grade for the course (lecture and lab).**
- The Participation grade is determined at the Professor's discretion and based on overall class performance.
- Complete required readings and pre-labs and update notebooks before the beginning of each lab session.
- There are no make-ups. If you miss lab, it is your responsibility to get the information from a classmate and/or from Blackboard.
- Late work will not be accepted unless a documented excuse can be provided within one week of the absence.
- Please be considerate and use cell phones and other electronic devices for lab purposes only while class is in session.
- Please show respect for your classmates and your professor.
- The professor is allowed to modify these or make additional policies throughout the semester as she sees fit to ensure students remain safe and are allowed an optimal educational experience.

Class Participation and Discussions

In this course there may be discussions or assignments that some students may find controversial, difficult, or sensitive. Please be considerate and respectful with your comments and remain open minded to the opinions of others that may not match your own. Sometimes the professor or speaker may choose to present contrasting opinions or viewpoints simply to promote and engage in a well-rounded discussion. Do not ever feel that a certain opinion or way of thinking is being forced on you in this course. If at any time you do not feel comfortable with an assignment or discussion in this course, please first communicate your feelings to the professor after which a course of action can be decided upon, if necessary.

48-Hour Pass

To be considerate of your busy schedule, each student will be allowed one 48-hour late pass. When you choose to use your pass, simply put a note in Blackboard in the 48-hour late pass dropbox stating which assignment you will be using your pass for and your new due date.

Use of AI Tools

Use of any AI tool (e.g. ChatGPT) for this course is strongly discouraged. You may use AI programs to help generate ideas and brainstorm, but you may not use AI programs in place of your own words, thoughts, or ideas (as expressed in any format). It is noteworthy that the material generated by AI programs is often inaccurate, incomplete, biased, or problematic. Use of AI programs also limits your own independent thinking and creativity.

For the purposes of this course, any AI generated work submitted as your own will be considered plagiarism. If you submit material generated by an AI program, it should be cited like any typical reference material (be considerate that AI generated references may be incorrect or nonexistent). Any plagiarism or other form of cheating will be referred to the Honor Court.

Honor Code

It is expected that students will uphold the Honor Code in this course. Collaboration on all assignments except the Lab Final is allowed. Each student must complete assignments in their own words; therefore, each submission shall be unique. Collaboration in this course does not mean handing in the same exact work. Data sets can be identical. Please contact the instructor with any questions or for clarification of a specific action. The Honor Code can be reviewed here: <https://www.hamilton.edu/student-handbook/studentconduct/honor-code>

On Campus Resources

There are times that each of us may feel overwhelmed, anxious, or depressed. There are many resources available on campus to help and support you:

- Counseling Center (www.hamilton.edu/offices/counselingcenter, 315-859-4340) offers individual and group therapy, peer counselors and psychiatric treatment. If you need immediate assistance, phoning the Counseling Center and selecting option 2 will connect you with a counselor, 24 hours a day, 7 days a week.
- Associate Dean of Students for Student Support, Sarah Solomon (315-859-4600; ssolomon@hamilton.edu)
- Associate Dean of Students for Academics, Adam Van Wynsberghe (315-859-4600; avanwyns@hamilton.edu)
- Your faculty advisor
- Your RA and Area Director in your residence hall

If at any time you feel suicidal or in danger of harming yourself or others, please reach out for support! The Hamilton community cares and is available to help. Campus Safety is available 24/7 for urgent concerns at 315-859-4000.

Academic Accommodations

Hamilton College will make reasonable accommodations for students with properly documented disabilities. If you are eligible to receive an accommodation(s) and would like to make a formal request for this course, please discuss it with me during the first two weeks of class. You will need to provide Allen Harrison, Assistant Dean for Accessibility Resources (aharriso@hamilton.edu) with appropriate documentation of your disability.

Emergency Preparedness:

In the event of an extended disruption of normal classroom activities, the format for this course may be modified to enable its completion within its programmed time. If you are unable to come to class due to illness, we will work together to establish a remote approach to meet your needs. Please contact me as soon as possible to arrange accommodations.

In the event of an evacuation order during class, we will evacuate to the main quad in front of SCCT and await further directions. In the event of a shelter-in-place order during class, we will stay in class until the order is called off. In the event that a shelter-in-place order is in effect when class starts, class will be cancelled for the day.

Note from the Instructor

If at any time throughout the semester circumstances arise that prevent you from performing as you normally would in this course, please email or speak to me privately and we will figure it out. I want to see everyone succeed in this course and their program. I am happy to work with anyone having extenuating circumstances. My two requests are that you please:

- 1) Notify me! I can't help you if I don't know about your situation. Please let me know before or during a hardship. Do not wait until the end of the semester because at that point there is little I can do to help.
- 2) Please don't take advantage.

I also hold myself to very high standards as an instructor, including rapid responses to student inquiries, grading within two weeks of due dates and overall support of the student experience. If at any time a life event prevents me from properly leading this course, I will be sure to let you know as soon as I can.

Over the course of the semester if anyone just needs to talk about their circumstances/stress/anxiety/etc., I am here for you.

Thank you all in advance for your perseverance and thoughtfulness towards others in the course.

Please feel free to contact me at any time throughout the semester with questions, problems, concerns, etc. I am here to help you succeed. If you show up, pay attention, hand in assignments on time, and work hard, you will most likely pass this course. Motivation, hard work and a positive attitude are the keys to success in this course.

Fall 2025 Calendar
(subject to change)

Date	Lab	Assignments Due
Sept. 3 or 4	Introduction; Lab Safety; Lab Notebooks; Concentration/Volume Equations	
Sept. 10 or 11	Experimental Design & Data Management; Testing for Biological Macromolecules	Pre-lab 1 1 st in class notebook check
Sept. 17 or 18	Scientific literature, navigating library resources; Podcast Intro.; Enzymes	Pre-lab 2
Sept. 24 or 25	Bacterial transformation w/pGLO plasmid; Milk Experiment	Pre-lab 3 Enzymes Post Lab Due 9/28 11:59pm
Oct 1 or 2	3D Modeling Intro.; Inoculate bacteria colonies, grow overnight in shaking water bath	Pre-lab 4
Oct. 8 or 9	Purify GFP & quantify	Pre-lab 5 Milk Mini-Lab Due 10/12 11:59pm
Oct. 15 or 16	No Labs- Fall Recess	
Oct. 22 or 23	3D Modeling/Printing Working Session	
Oct. 29 or 30	Bioinformatics part I	Pre-lab 6
Nov. 5 or 6	Covid testing week 1: PCR and ELISA	Pre-lab 7
Nov. 12 or 13	Covid testing week 2: Gel Electrophoresis; Bioinformatics Part II	Pre-lab 8 3D Printing Assignment Due in Lab
Nov. 19 or 20	PTC week 1: DNA extraction & PCR	Pre-lab 9
Nov. 26 or 27	No Labs- Thanksgiving Recess	
Dec. 3 or 4	PTC week 2: Gel Electrophoresis	Pre-lab 10 Covid Lab Report Due 11/16 11:59pm
Dec. 10 or 11	PTC week 3: Pedigree and population genetics	Pre-lab 11 PTC Post Lab Due 12/14 11:59pm