

# Syllabus


## BIOL 103: How Cells Work (section 002)!

**Meeting time:** Monday, Wednesday, and Friday, 1:25-2:15 PM

**Meeting Location:** Coker 201

**Professor:** Dr. Laura Ott (she/her)

**Email:** [leott@email.unc.edu](mailto:leott@email.unc.edu) (<mailto:leott@email.unc.edu>)

**Website:** <https://bio.unc.edu/faculty-profile/ott-laura/>   
(<https://bio.unc.edu/faculty-profile/ott-laura/>)



**Learn more about Dr. Ott** [HERE](#) 

([https://docs.google.com/document/d/1rKlJmTeLQDQEkn83hJ\\_fHISxRtcNtAScu-2kPPSfeT4/edit?usp=sharing](https://docs.google.com/document/d/1rKlJmTeLQDQEkn83hJ_fHISxRtcNtAScu-2kPPSfeT4/edit?usp=sharing)).



**Office hours:** Virtual office hours, which are for students to meet with me about something personal in nature, will generally be Thursdays from 10-11 AM and you can sign up for a 10-minute appointment via the Canvas Calendar. In-person office hours (Wilson Hall 104) will be Tuesdays from 2-3 PM and these are group office hours, or an opportunity for large groups of students to meet about non-personal class content (e.g., anyone from class can attend at any point during this window of time). You can learn more about how to sign up for and attend office hours, as well as what you can expect from office hours, [HERE](https://uncch.instructure.com/courses/35120/pages/about-the-instructor) (<https://uncch.instructure.com/courses/35120/pages/about-the-instructor>).

## Welcome!

I welcome you to this course and the Biology Department. In our department, we think about you holistically as an individual with identities different from your peers and strive to make an environment that feels inclusive. We think about not only biological content, but also how to develop you as a critical thinker and consumer of information. As much as it is our role to teach you biology, we see it equally important to develop you as a whole person. If you would like to give feedback to me at any time, you can fill out this [form](https://unc.az1.qualtrics.com/jfe/form/SV_8qcMOHcUfKoGbbw)  ([https://unc.az1.qualtrics.com/jfe/form/SV\\_8qcMOHcUfKoGbbw](https://unc.az1.qualtrics.com/jfe/form/SV_8qcMOHcUfKoGbbw)) (anonymously if you choose). You can also give feedback to the biology department about our curriculum [here](https://bio.unc.edu/undergraduate/links/student-feedback/) .


*The instructor reserves the right to make changes to this syllabus, to include assignment and test due dates, based on the needs of the class and/or extenuating circumstances (excluding the university-scheduled final examination). Any changes will be communicated to students via Canvas and their UNC email addresses in a timely manner for students to plan accordingly.*

**Piazza:** We will be using Piazza as a class discussion for us to interact with each other outside of our scheduled class time. If you have a question about the class, please consider posting it there. The instructional team will be monitoring Piazza and answering questions when we can, but we are also going to rely on you to answer your class colleagues' questions. Please be mindful of not providing specific answers to questions about assignments (e.g., don't tell people that the answer to Q5 is B). You can learn more about Piazza and join the site at:

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## Course Description & Learning Objectives

**Course description:** This class is designed for first- or second-year students beginning their study of biological sciences. The course will cover both biological concepts and scientific competencies necessary for a foundational mastery of genetics, molecular biology, and cellular biology. For biology majors, this is one of the three mandatory fundamentals courses required (Biol 103, 104, 105) before taking relevant 200-level core classes and upper-level electives.

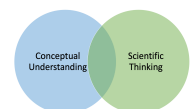
**Prerequisite:** Biology 101 credit (UNC credits or BE) or placement (PL) through the Biology 101 [placement exam](https://bio.unc.edu/biology-101-placement-exam/)  [\(https://bio.unc.edu/biology-101-placement-exam/\)](https://bio.unc.edu/biology-101-placement-exam/).

This course fulfills the **Natural Scientific Investigation** IDEAs in Action General Education component. Questions to consider as a student in any Natural Scientific Investigation course:

- What rules govern the natural world and how are they discovered, tested, and validated?
- What is distinctive about the approach to understanding employed in the natural sciences?
- What challenges are encountered in making measurements of the natural world?
- What are the limits of investigation in the natural sciences?

In BIOL 103, we will learn many **foundational biological concepts** together. By the end of this course, you should be able to:

- Relate essential functions of cells to the structure of their cellular components and organelles
- Connect molecular mechanisms to cellular functions and predict outcomes when molecular mechanisms are altered.
- Relate genes and alleles to cellular functions and potential pathologies
- Curate a set of techniques that scientists use in experiments that create knowledge in genetic, molecular, and cellular biology.



- Identify themes of biology (structure/function, information, evolution, interactions within and between systems, transformations of energy and matter) within concepts of genetic, molecular, and cellular biology.

We'll also learn **biological thinking skills** and do some things that scientists do daily. By the end of BIOL 103, you should be able to:

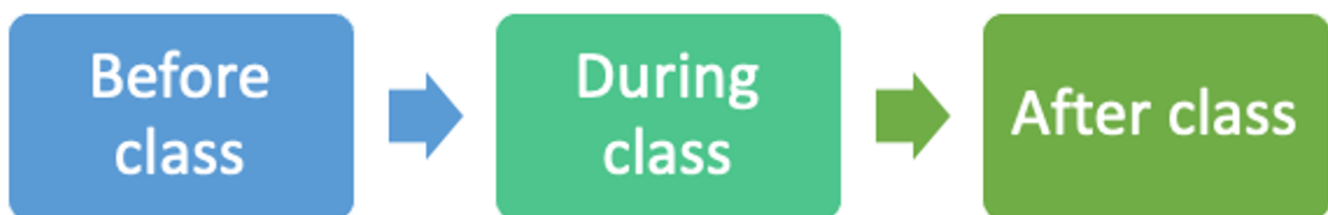
- Demonstrate the ability to use scientific knowledge, logic, and imagination to construct and justify scientific claims about phenomena, including validation through rigorous empirical testing.
- Analyze and apply processes of natural scientific inquiry as dictated by the phenomena and questions at hand. These include generating and testing hypotheses or theories; using logic and creativity to design investigations to test these hypotheses; collecting and interpreting data; making inferences that respect measurement error; building and justifying arguments and explanations; communicating and defending conclusions; revising arguments and conclusions based on new evidence and/or feedback from peers; and synthesizing new knowledge into broader scientific understanding.
- Evaluate science-related claims and information from popular and/or peer-reviewed sources by examining the relationship between the evidence, arguments, and conclusions presented and by assessing consistency with existing knowledge from valid and reliable scientific sources.
- Identify, assess, and make informed decisions about ethical issues at the intersections of the sciences and society.

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## Course Structure

**Course website:** [canvas.unc.edu](https://canvas.unc.edu)


All of your materials for this course and all communication will go through Canvas. The set up for every class will be a **module page** consisting of what to do/submit before class, what to bring and do during class, and what to complete after class.



**Structure:** This class has built-in structure with the before class, in-class, and after class required assignments and activities. This structure provides continual required practice, which is an important part of learning. We have evidence that this required structure ensures all learners more equitable access to being successful in this course. Want to see these data that show that structured learning promotes equitable learning for students? Ask – we'd be happy to share!

**Flexibility:** Sometimes life gets in the way of learning. We have built some flexibility and mistake-making into the course. Thus, you don't have to be perfect! Let go of perfectionism and try to enjoy learning for the sake of learning. Be kind to yourself and recognize when you need some self-compassion and care. If the built-in flexibility available to all students is not working due to something big in your life, please speak with me by email or in person.

Class sessions will be recorded and posted to Canvas afterwards if you need to miss class or want to review any parts. Refer to the Panopto Video tab on Canvas for these recordings (they will be listed by the date of the class session).


Oops tokens for lateness: You have 5 "oops tokens" you can use if you need extensions during the semester without needing to explain. Oops tokens are only for assignments that you did not submit by the deadline, not to repeat an assignment to earn a higher score. Because I will need time to go through and award the oops tokens before posting final grades, the oops token form will close on Dec. 1st at 11:59 PM (note that there may be assignments after this date). Learn more and complete the form <https://forms.gle/KsXska1XUFqm4o638>  (<https://forms.gle/KsXska1XUFqm4o638>)

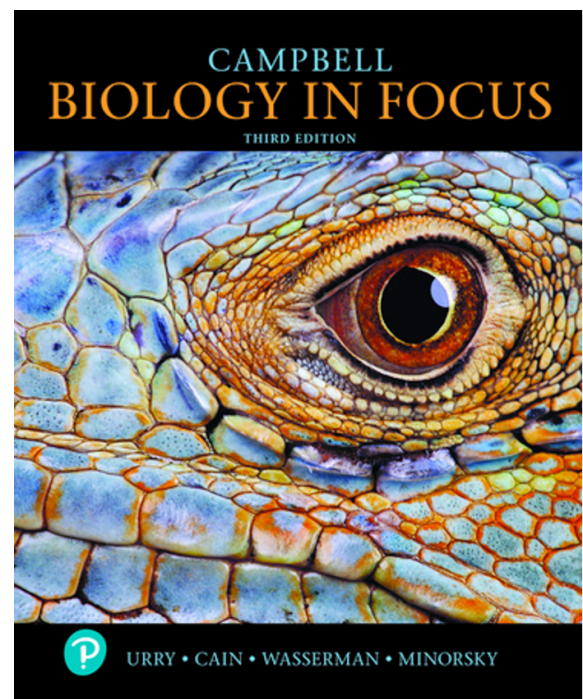
## Required Resources

**Textbook and Digital Delivery:** Campbell Biology in Focus, 3rd Ed (Urry, Cain, Wasserman, and Minorsky), which should include:

1. Mastering Biology
2. eBook
3. Learning Catalytics

Purchase via the UNC Student Store (an access code will be emailed to you) or directly from Pearson.

You will access Mastering and Learning Catalytics through the "Access Pearson" link on the left menu bar. This will take you directly to the Mastering site for this course. Learn more about how to set up your Mastering account, to include how to sign up for a free 14-day free trial, [HERE](#) 



[https://support.pearson.com/getsupport/s/document-item?bundleId=Register-for-MyLab-and-Mastering-with-Canvas&topicId=Register-for-MyLab-and-Mastering-with-Canvas.pdf&\\_LANG=enus](https://support.pearson.com/getsupport/s/document-item?bundleId=Register-for-MyLab-and-Mastering-with-Canvas&topicId=Register-for-MyLab-and-Mastering-with-Canvas.pdf&_LANG=enus)).

ACCESS CODE: Your code will be unique to you (and it will be emailed to you directly from the bookstore)

The above [instructions](#) 

<https://support.pearson.com/getsupport/s/document-item?bundleId=Register-fo>) also have details on how you can set up a free 14-day trial while you wait for your access code. Please be sure to use your UNC email to set up your free trail!

**It is important to pay for your digital delivery access code by the third week of the semester to ensure that you have consistent access to these required course materials** (accounts may be deactivated for students who have not paid their digital delivery fees). *Receiving your access code does not mean that you've paid your bill*; you must navigate to the UNC Student Stores website to pay for your access code sent by digital delivery (invoices will not be sent). Be sure to secure a purchase confirmation from UNC Student Stores to avoid having your account deactivated. Deadlines will not be extended for students who lose access to the Mastering platform due to unpaid digital delivery bills. Please know that we have worked with UNC Student Stores and Pearson (book publisher) to keep the costs associated with these required materials as low as possible!


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## Grades


**Final grades are made of six components.**

1. **Participation** (8% of grade): Your participation grade will come from Learning Catalytics (3%), Guided Reading Questions--GRQs (3%), and participation in in-class activities (2%).


**Learning Catalytics:** you will complete these during class (you must be present in class to earn the points). This is an opportunity to practice higher-order thinking questions in class, often collaborative with peers, to assess and refine your understanding of the topics. You will

access Learning Catalytics through your Pearson Mastering account and should log in for the active session at the start of class (the Learning Catalytics session code will be posted at the start of class). Each question that is deployed is worth a point and it's important that you respond to ALL questions within a single class period (each class period will have 1-10 points possible). As long as you respond to the question, you will get the point (remember, you should respond to all questions deployed in each class session). *Flexibility:* 15% of the possible Learning Catalytics points (remember that there are multiple points per class session) will be dropped at the end of the semester to account for occasionally missing class, tech problems, etc. Please note that there are multiple opportunities to earn participation in this class, so missing a class or two will not hurt your overall grade. If you miss more than 2 classes, see the "oops tokens" [form](https://forms.gle/GQGzjnt31sVtM2MV9)  (<https://forms.gle/GQGzjnt31sVtM2MV9>). The Learning Catalytics questions will be open only during scheduled class time and grades will be based on participation (not graded for correctness).

**In-class activities:** throughout the semester, you will participate in activities during class related to experimental design, interpretation of experimental results, and science communication. Examples include formulating posters about an experimental technique and/or peer reviewing your class colleagues' poster presentations. While these activities will not be graded for accuracy (graded for completion), it is expected that students fully engage and participate in them as they were graded. *Flexibility:* If you miss a class where an in-class activity is performed, you can submit to the "oops token" [form](https://forms.gle/GQGzjnt31sVtM2MV9)  (<https://forms.gle/GQGzjnt31sVtM2MV9>) to make up the work.

**Guided Reading Questions (GRQs)** will be graded for completion. The purpose of the GRQs is for us to communicate the important aspects of the textbook where you should focus your attention. Think of the GRQs as your notes from the reading and if you are taking additional notes beyond what is in the GRQs, you may end up focusing on something that won't be covered in the class and/or content that we feel is not crucial to your learning. You may collaborate on these to learn from each other, but you may not submit identical assignments. We want these to be in your own words and ideas for developing your own study guides. These are for you! They should be completed *before* doing Mastering assignments and must be uploaded to Canvas by 10 AM, ET on the day of class (refer to [class schedule](https://uncch.instructure.com/courses/35120/pages/class-schedule) (<https://uncch.instructure.com/courses/35120/pages/class-schedule>) for due dates). We recommend submitting GRQs 20-30 minutes before the deadline to allow for loading and possible internet issues. You must submit your GRQs as a PDF or Word document in Canvas. Answers to the GRQs will not be posted, as the answers should be clear from your active engagement in class. *Flexibility:* Two GRQs will be dropped from everyone's grades-- if you miss more, see the "oops tokens" [form](https://forms.gle/GQGzjnt31sVtM2MV9)  (<https://forms.gle/GQGzjnt31sVtM2MV9>).

**2. Homework via Mastering Biology (8% of grade):** Homework will be due by 10 AM, ET on the day of class (refer to the [class schedule](https://uncch.instructure.com/courses/35120/pages/class-schedule) (<https://uncch.instructure.com/courses/35120/pages/class-schedule>) for due dates). Some assignments will take as little as 20 minutes, while others may take

over an hour with the animations and short tutorials. It is your responsibility to start it in a timely fashion, so that you finish it by the due date. \*\*I recommend submitting at least 30 minutes before the due date to ensure successful uploading / submissions Note: These questions are often lower level and not equivalent to exam questions. They are meant to help you learn/practice as you begin to familiarize yourself with concepts and skills and to assess your understanding of the assigned reading. *Flexibility*: Late homework in Mastering receives a zero, but you can redeem oops tokens for these [here](https://forms.gle/GQGzjnt31sVtM2MV9)  (<https://forms.gle/GQGzjnt31sVtM2MV9>) if you miss a deadline (you must complete the Mastering assignment before submitting the oops token). Assignments post about one week before they are due so that you can adjust to your own schedule and time demands.

**3. Lesson Quizzes (12% of grade):** At the end of each week, there will be 1-2 short quizzes due. Each quiz will have up to 5 multiple choice questions and will be 5 points each. You will complete these timed quizzes (30 minutes) at the end of each week through Gradescope (most are due Sunday at 11:59 PM, ET). Quizzes will be available starting approximately 72 hours before they are due. This allows you to give yourself a chance to practice timed questions with your own notes. Quiz questions are going to be analogous to exam-style questions, so they will be a great way for you to self-assess your understanding of the course material and where you should focus your study habits. This is a good time each week to consolidate your notes and think about what information would be useful to add to your one-page study guide for the next exam. *Flexibility*: Your four lowest quizzes (approximately 20%) will be dropped and oops tokens cannot be used for quizzes.

**4. Unit Quizzes (8% of grade):** prior to each of the unit exams and the final exam, students will take an online quiz that will consist of exam-style practice problems. Students will have 60 minutes to complete the 25 multiple choice questions. The purpose of these quizzes are to help students prepare for the exams by completing practice problems. It is important to note that these quizzes will not be comprehensive of the exams, as there might be content that is covered in class between the unit quiz due date and the exam, although they should be representative of the types of questions you will expect. These unit quizzes will open and be available for 48 hours before their due date. *Flexibility*: your lowest unit quiz will be dropped at the end of the semester. Oops tokens may not be used for unit quizzes.

**5. Mid-Semester Exams (40% of grade):** The format will be multiple choice and short answer and in-class (timed and proctored). There will be three mid-semester exams given during the semester. While the exams will be closed book, students may have a single piece of 8.5x11" (standard) paper with notes written on both sides to use during the exams (no tape, glue, staples, etc. are permitted on this document). Students must use this [document](https://uncch.instructure.com/courses/15290/files/2141055?wrap=1) (<https://uncch.instructure.com/courses/15290/files/2141055?wrap=1>) for their sheet of notes and must submit your notes document at the end of the exam. Students should plan to complete (and print, if applicable) their cheat sheet well before the exam period, as students will not be allowed to start the exam late and/or take a make-up exam due to a missing or incomplete cheat sheet. Make yourself a copy before the exam, as you will not get these returned. Students may not share cheat sheets with other students. Each semester exam will cover the material specified on the [course schedule](#)

(<https://uncch.instructure.com/courses/35120/pages/class-schedule>), although topics related to scientific thinking may be found on all exams. *Flexibility*: your lowest exam score will be dropped; oops tokens may not be used for mid-semester exams.

**Exams will be online (in-person, closed-book, proctored) on Gradescope and students should bring their computer to the exam period.** Students may only have Gradescope open on their computer during the exam. All other browser windows and other documents/programs must be closed out and students must set their screens such that the instructional team can visibly see their screen from 5 feet away. Failure to comply with this will result in an automatic zero on the exam. Students may not leave the classroom until the exam period has ended and should plan accordingly by bringing a book or other non-technology activity to work on during the remainder of the exam period (computers, cell phones, and other electronic devices will not be permitted after students complete their exam). The instructor reserves the right to change the exam format to a paper exam at any point during the semester based on the needs of the class.

Make-up exams will only be offered to students if they have a university approved absence or other form of documentation (e.g., doctor's note) that is submitted to the instructor via email in advance of the exam. All make-up exams must be completed within 1 week of the scheduled exam date. If a student cannot take a make-up exam as outlined above, the missed exam will automatically be their lowest dropped exam for the semester. Students can expect the make-up exams to be different in format from the exam given in the regularly scheduled exam period.

**6. Final Exam (20% of grade).** The **cumulative** final exam will take place during the University exam period for this class and will be a paper exam (students will be provided an answer sheet along with an exam booklet for the exam). Students may have a single 8.5x11" piece of paper with notes on both sides of the paper when taking the final exam (no tape, glue, staples, etc. are permitted). Students should use this **document** (<https://uncch.instructure.com/courses/15290/files/2141055?wrap=1>) to generate their sheet of notes and must submit this document with their final exam.

*\*If you are a student registered with Accessibility Resource Services (ARS) and you require extended time and/or low-distraction isolated setting, please be sure to schedule all your exams with ARS at the beginning of the semester. We ask that you try your best to schedule your exam in ARS on the same calendar day that the exam is listed on the course schedule. Please come discuss any accommodations you may need for this format exam or any other aspects of the course.*

**Final grades will be assigned by averaging the components for the entire semester:**

A = 93 - 100

A- = 90 - 92.9

B+ = 87 - 89.9

B = 83 - 86.9



B- = 80 - 82.9

C+ = 77 - 79.9

C = 73 - 76.9

C- = 70 - 72.9

D+ = 66 - 69.9

D = 60 - 65.9


F = 0 - 59.9









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## Course Policies & Resources

I value the perspectives of individuals from all backgrounds reflecting the diversity of our students. I broadly define diversity to include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. I strive to make this classroom an inclusive space for all students. Please let me know if there is anything I can do to improve, I appreciate suggestions.

### Attendance Policy


**University Policy:** As stated in the University's [Class Attendance Policy](#)  (<https://catalog.unc.edu/policies-procedures/attendance-grading-examination/#text>), no right or privilege exists that permits a student to be absent from any class meetings, except for these University Approved Absences:

1. Authorized University activities: [University Approved Absence Office \(UAAO\) website](#)  (<https://uaao.unc.edu/sample-page/>) provides information and [FAQs for students](#)  (<https://uaao.unc.edu/faqs-for-students/>) and [FAQs for faculty](#)  (<https://uaao.unc.edu/sample-page/>) related to University Approved Absences
2. Disability/religious observance/pregnancy, as required by law and approved by [Accessibility Resources and Service](#)  (<https://ars.unc.edu/>) and/or the [Equal Opportunity and Compliance Office](#)  (<https://eoc.unc.edu/what-we-do/accommodations/>) (EOC)
3. Significant health condition and/or personal/family emergency as approved by the [Office of the Dean of Students](#)  (<https://odos.unc.edu/>), [Gender Violence Service Coordinators](#)  (<https://gvsc.unc.edu/>), and/or the [Equal Opportunity and Compliance Office](#)  (<https://eoc.unc.edu/what-we-do/accommodations/>) (EOC).


Instructors may work with students to meet attendance needs that do not fall within University approved absences. For situations when an absence is not University approved (e.g., a job interview,


illness/ flu or club activity), instructors are encouraged to work directly with students to determine the best approach to missed classes and make-up assessment and assignments.

### **Honor Code**

All students are expected to follow the guidelines of the UNC Honor Code. In particular, students are expected to refrain from “lying, cheating, or stealing” in the academic context. If you are unsure about which actions violate the Honor Code, please see me or consult [studentconduct.unc.edu](https://studentconduct.unc.edu)  (<https://studentconduct.unc.edu/>).

### **Acceptable Use Policy**


By attending the University of North Carolina at Chapel Hill, you agree to abide by the University of North Carolina at Chapel Hill policies related to the acceptable use of IT systems and services. The Acceptable Use Policy (AUP) sets the expectation that you will use the University’s technology resources responsibly, consistent with the University’s mission. In the context of a class, it’s quite likely you will participate in online activities that could include personal information about you or your peers, and the AUP addresses your obligations to protect the privacy of class participants. In addition, the AUP addresses matters of others’ intellectual property, including copyright. These are only a couple of typical examples, so you should consult the full [Information Technology Acceptable Use Policy](https://policies.unc.edu/TDCClient/2833/Portal/KB/ArticleDet?ID=131247) , which covers topics related to using digital resources, such as privacy, confidentiality, and intellectual property.

Additionally, consult the [Safe Computing at UNC](https://safecomputing.unc.edu/) , website for information about data security policies, updates, and tips on keeping your identity, information, and devices safe.

### **Generative Artificial Intelligence Use**

The University has offered various resources related to setting policies around the use of Generative AI (i.e. ChatGPT), but faculty are expected to set explicit policies for each class. In other words, what is allowed in one class may not be allowed in another. In our class, use of Generative AI for the purposes of answering Piazza posts or submitting any type of graded work is strictly prohibited. You are responsible for the scientific accuracy of your work, and the purpose of assignments is to provide opportunities for you to demonstrate your scientific knowledge and your communication skills. Use of Generative AI circumvents those goals, rendering the assignment useless to your learning process, and potentially misleading to others who may read the text. Failure to adhere to these policies will constitute a lapse of personal integrity and a violation of the UNC Honor Code.

### **Accessibility Resources and Service**

[Accessibility Resources and Service](https://ars.unc.edu/) , (ARS – [ars@unc.edu](mailto:ars@unc.edu) [\(<mailto:ars@unc.edu>\)](mailto:ars@unc.edu)) receives requests for accommodations, and through the Student and Applicant Accommodations Policy determines eligibility and identifies reasonable accommodations for students

with disabilities and/or chronic medical conditions to mitigate or remove the barriers experienced in accessing University courses, programs and activities.

ARS also offers its Testing Center resources to students and instructors to facilitate the implementation of testing accommodations.

Faculty and instructors with any concerns or questions about accommodations and/or their implementation, are invited to [reach out to ARS \(mailto:ars@unc.edu\)](mailto:ars@unc.edu) to discuss.

### **Counseling and Psychological Services**

UNC-Chapel Hill is strongly committed to addressing the mental health needs of a diverse student body. The [Heels Care Network](http://care.unc.edu) [↗](http://care.unc.edu) (<http://care.unc.edu>) website is a place to access the many mental health resources at Carolina. CAPS is the primary mental health provider for students, offering timely access to consultation and connection to clinically appropriate services. Go to their website <https://caps.unc.edu/> [↗](https://caps.unc.edu/) (<https://caps.unc.edu/>) or visit their facilities on the third floor of the Campus Health building for an initial evaluation to learn more. Students can also call CAPS 24/7 at 919-966-3658 for immediate assistance.

### **Title IX and Related Resources**

Any student who is impacted by discrimination, harassment, interpersonal (relationship) violence, sexual violence, sexual exploitation, or stalking is encouraged to seek resources on campus or in the community. Reports can be made online to the EOC at <https://eoc.unc.edu/report-an-incident/> [↗](https://eoc.unc.edu/report-an-incident/) (<https://eoc.unc.edu/report-an-incident/>) or by contacting the University's Title IX Coordinator (Elizabeth Hall, [titleixcoordinator@unc.edu \(mailto:titleixcoordinator@unc.edu\)](mailto:titleixcoordinator@unc.edu)) or the Report and Response Coordinators in the Equal Opportunity and Compliance Office ([reportandresponse@unc.edu \(mailto:reportandresponse@unc.edu\)](mailto:reportandresponse@unc.edu)). Confidential resources include Counseling and Psychological Services and the Gender Violence Services Coordinators ([gvsc@unc.edu \(mailto:gvsc@unc.edu\)](mailto:gvsc@unc.edu)). Additional resources are available at [safe.unc.edu](https://safe.unc.edu/) [↗](https://safe.unc.edu/) (<https://safe.unc.edu/>).

### **Policy on Non-Discrimination**

The University is committed to providing an inclusive and welcoming environment for all members of our community and to ensuring that educational and employment decisions are based on individuals' abilities and qualifications. Consistent with this principle and applicable laws, the University's [Policy Statement on Non-Discrimination](https://eoc.unc.edu/our-policies/policy-statement-on-non-discrimination/) [↗](https://eoc.unc.edu/our-policies/policy-statement-on-non-discrimination/) (<https://eoc.unc.edu/our-policies/policy-statement-on-non-discrimination/>) offers access to its educational programs and activities as well as employment terms and conditions without respect to race, color, gender, national origin, age, religion, genetic information, disability, veteran's status, sexual orientation, gender identity or gender expression. Such a policy ensures that only relevant factors are considered, and that equitable and consistent standards of conduct and performance are applied.

If you are experiencing harassment or discrimination, you can seek assistance and file a report through the Report and Response Coordinators (email [reportandresponse@unc.edu](mailto:reportandresponse@unc.edu) (<mailto:reportandresponse@unc.edu>)) or see additional contact info at [safe.unc.edu](https://safe.unc.edu) (<https://safe.unc.edu>) or the Equal Opportunity and Compliance Office at <https://eoc.unc.edu/report-an-incident/> (<https://eoc.unc.edu/report-an-incident/>).

### [Undergraduate Testing Center](#)

The College of Arts and Sciences provides a secure, proctored environment in which exams can be taken. The center works with instructors to proctor exams for their undergraduate students who are not registered with ARS and who do not need testing accommodations as provided by ARS. In other words, the Center provides a proctored testing environment for students who are unable to take an exam at the normally scheduled time (with pre-arrangement by your instructor). For more information, visit <http://testingcenter.web.unc.edu/> (<http://testingcenter.web.unc.edu/>).

### [Learning Center](#)

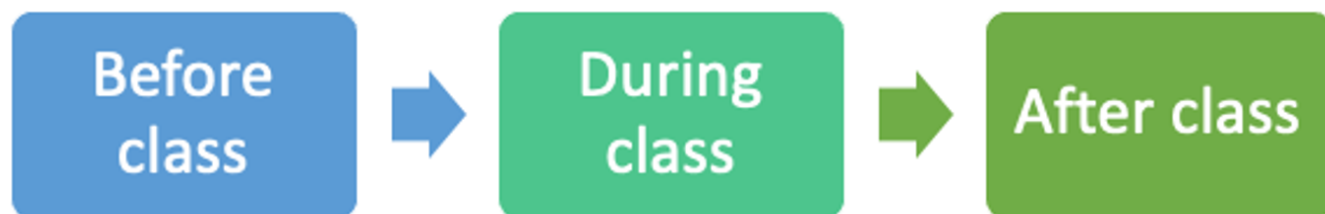
Want to get the most out of this course or others this semester? Visit UNC's Learning Center at <http://learningcenter.unc.edu> (<http://learningcenter.unc.edu>) to make an appointment or register for an event. Their free, popular programs will help you optimize your academic performance. Try academic coaching, peer tutoring, STEM support, ADHD/LD services, workshops and study camps, or review tips and tools available on the website.

### [Writing Center](#)

For free feedback on any course writing projects, check out UNC's Writing Center. Writing Center coaches can assist with any writing project, including multimedia projects and application essays, at any stage of the writing process. You don't even need a draft to come visit. To schedule a 45-minute appointment, review quick tips, or request written feedback online, visit <http://writingcenter.unc.edu> (<http://writingcenter.unc.edu>).

# Class Schedule

This class will adopt a class schedule that will include before class assignments (GRQs and Mastering), in-class activities, and after class assignments (quizzes).



**Before class assignments** allow you to gauge what you are learning from the reading and what is unclear. These assignments will be at 10 AM on the day listed in the syllabus and before the lesson is covered in class. Most days this includes submitting Guided Reading Questions (GRQS) on Canvas (graded for completion) and completing an online Mastering assignment (graded for accuracy). Dishonesty on this work only hurts you later on exams. It's okay if you find these questions challenging, the idea is to figure out what you need more practice with.


**During class** we will have individual and collaborative activities and practice problems that help you dive into concepts deeply. Be sure to have a copy of the course outlines available, as they will help you take notes and fully engage in the class activities!

At the end of each week there will be a short quiz on Gradescope that is graded for accuracy (**after class assignments**). Most of these will be due on Sundays at 11:59 PM, ET (they will release approximately 72 hours before they are due). See the syllabus for details.

*The schedule is subject to change based on the needs of the class and any changes will be communicated to students in advance via announcements made in Canvas. The unit exams and final exam dates will not change, however, unless there are extenuating circumstances.*

## *Unit 1: Genetic disorders highlight gene expression processes*

Lesson	Date	Learning Objectives	Assignments
			(GRQs and Mastering are due at 10 AM, ET on the day of class GRQs should be completed and submitted first before completing Mastering)

0	Mon., Aug. 21	<ul style="list-style-type: none"> <li>• Discuss course logistics and active learning</li> <li>• Apply the themes of life to descriptive passages</li> </ul>	<p><u>Before class:</u> read the syllabus and familiarize yourself with Canvas. Purchase required eBook/Mastering and set up account. Everyone gets free temporary (14-day access). Learn more <a href="#">HERE</a> </p> <p><a href="https://support.pearson.com/getsupport/s/document-item?bundleId=Register-for-MyLab-and-Mastering-with-Canvas&amp;topicId=Register-for-MyLab-and-Mastering-with-Canvas.pdf&amp;LANG=enus">https://support.pearson.com/getsupport/s/document-item?bundleId=Register-for-MyLab-and-Mastering-with-Canvas&amp;topicId=Register-for-MyLab-and-Mastering-with-Canvas.pdf&amp;LANG=enus</a>).</p> <p><u>After class:</u> review what is required for class each day.</p>
1	Wed., Aug. 23	<ul style="list-style-type: none"> <li>• Identify the independent and dependent variables in a controlled experiment and control/experimental groups</li> <li>• Identify positive and negative controls</li> <li>• Interpret different kinds of data</li> <li>• Practice representing data in graph</li> </ul>	<p><u>Before class:</u> GRQ-1, Introduction to Mastering, and Mastering-Lesson 1</p>
	Fri., Aug. 25	Continuation of lesson 1 content	<p><u>After class:</u> Lesson 1 quiz on Gradescope (due Aug. 27, 11:59 PM, ET)</p> <p>Complete <a href="#">biology pre-assessment online</a> (<a href="https://uncch.instructure.com/courses/35120/assignments/27716">https://uncch.instructure.com/courses/35120/assignments/27716</a> (due Aug. 25 at 11:59 PM) -- counts towards in-class activity points.</p>
2	Mon., Aug. 28	<ul style="list-style-type: none"> <li>• Organize the steps of eukaryotic gene expression and identify the primary</li> </ul>	<p><u>Before class:</u> GRQ-2 and Mastering-Lesson 2</p>

		<p>molecules involved in each step.</p> <ul style="list-style-type: none"> <li>• Outline the major pathways newly synthesized proteins move through or out of a cell.</li> <li>• Describe how different types of genetic medicine can be used to treat various genetic conditions.</li> <li>• Propose a genetic medicine that could be used to treat a specific disease</li> </ul>	
3	Wed., Aug. 30	<ul style="list-style-type: none"> <li>• Discern the mode of inheritance for single trait autosomal diseases</li> <li>• Make predictions via punnett squares and pedigrees about inheritance of single gene autosomal diseases based on gamete formation during meiosis</li> <li>• Design a study with controls to examine mRNA and protein expression within tissues.</li> <li>• Define pleiotropy and connect function and tissue-</li> </ul>	<u>Before class:</u> GRQ-3 and Mastering-Lesson 3

		specific location of protein based on disease phenotypes and mRNA/protein based data	
	Fri., Sep. 1	Continuation of lesson 3	<u>After class:</u> Lesson 2 and lesson 3 quizzes on Gradescope (due Sept. 5 at 11:59 PM, ET)
	Mon., Sep. 4	No class -- Labor Day	-
4	Wed., Sep. 6	<ul style="list-style-type: none"> <li>• Draw the anatomy of a eukaryotic gene including promoter, control elements, exon/introns, start and stops and 5' and 3' UTR of mRNA</li> <li>• Label the directionality of DNA and mRNA strands during transcription and determine the location of a promoter for a specific gene when given information about transcription.</li> <li>• Explain tissue specific expression by modeling control elements and transcription factors.</li> <li>• Analyze experimental data relative to control elements.</li> </ul>	<u>Before class:</u> GRQ-4 and Mastering-Lesson 4



		<ul style="list-style-type: none"> <li>• Compare sequences to identify and name a specific type of mutation.</li> <li>• Trace molecular mutations from DNA to mRNA to protein and predict how the mutation affects protein structure, function, location, or expression level in a cell.</li> </ul>	
	Fri., Sep. 8	Continuation of lesson 4	<u>After class:</u> Lesson 4 quiz on Gradescope (due Sept. 10 at 11:5 PM, ET)
5	Mon., Sep. 11	<ul style="list-style-type: none"> <li>• Draw the structure of DNA and compare it to RNA.</li> <li>• Draw a replication bubble with bidirectional replication, labeling the leading and lagging strands and associated proteins.</li> <li>• Describe how the two, anti-parallel strands of the DNA molecules are replicated simultaneously.</li> <li>• Compare/contrast replication in prokaryotes with eukaryotes.</li> </ul>	<u>Before class:</u> GRQ-5 and Mastering-Lesson 5

6	Wed., Sep. 13	<ul style="list-style-type: none"> <li>• Compare and contrast in vivo DNA replication and PCR (in vitro DNA replication)</li> <li>• Design PCR primers and evaluate PCR results via gel electrophoresis</li> <li>• Describe RT-PCR reaction</li> <li>• Analyze experimental controls associated with an RT-PCR reaction.</li> </ul>	<u>Before class:</u> GRQ-6 and Mastering-Lesson 6
	Fri., Sep. 15	Continuation of lesson 6	<u>After class:</u> Lesson 5 and lesson 6 quizzes on Gradescope (due Sep. 17 at 11:59 PM, ET)
7	Mon. Sep. 18	<ul style="list-style-type: none"> <li>• <i>Explain what molecules are examined, what can be learned, and the basics of how each technique works: PCR, RT-PCR, SDS-PAGE and Western blot</i></li> <li>• <i>Analyze data from molecular techniques to explain the relationship between genotype and phenotype at different biological levels</i></li> </ul>	<u>Before class:</u> GRQ-7 and Mastering-Lesson 7

		<ul style="list-style-type: none"> <li>• <i>Design molecular experiments that demonstrate the need for controls</i></li> </ul>	
	Wed. Sep. 20	Continuation of lesson 7	<u>After class:</u> Lesson 7 quiz on Gradescope (due Sep. 21 at 11:5 PM, ET)
8	Fri., Sep. 22	<p><b>IN-CLASS ACTIVITY</b></p> <ul style="list-style-type: none"> <li>• <i>Summarize gene flow including chromatin remodeling through protein folding and localization in/outside the cell.</i></li> <li>• <i>Research a genetic disease to describe characteristics around inheritance, genotype linked to phenotype at different levels (protein, organism), and consider how genetic medicine is or might treat the disease</i></li> <li>• <i>Synthesize a summary poster and communicate with classmates about your group's disease.</i></li> <li>• <i>Identify aspects of effective science communication.</i></li> </ul>	<p><u>Before class:</u> GRQ-8 (no Mastering or quiz for this lesson)</p> <p><u>After class:</u> 1) complete lesson 8 reflection and upload poster from class) and 2) Unit 1 quiz on Gradescope (due Sep. 22 at 11:59 PM, ET)</p>
	Mon., Sep.	No class -- UNC Wellbeing Day	-

25	<p><b>EXAM 1 (lessons 1-8).</b> Students may have a single 8.5x11 sheet of paper with notes on both sides (no tape, glue, staples, etc.). Use this DOCUMENT</p> <p>Wed., for your notes and Sep. 27 remember to include your name and PID in the designated location. To prepare for the exam, review: GRQs and class outlines, quizzes, and study guide found on the unit 1 page.</p>	
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## Unit 2: How cells control division and differentiation

Lesson	Date	Learning Objectives	Assignments
9	Fri., Sep. 29	<ul style="list-style-type: none"> <li>Predict how certain drugs might affect replication.</li> <li>Compare telomerase expression in cancer cells and non-cancer cells.</li> <li>Draw how the ends of chromosomes shorten with each round of replication and explain how telomerase prevents shortening.</li> </ul>	<p>(GRQs and Mastering are due at 10 AM, ET on the day of class. GRQs should be completed and submitted first before completing Mastering)</p> <p><u>Before class:</u> GRQ-9 and Mastering-Lesson 9</p> <p><u>After class:</u> Lesson 9 quiz on Gradescope (due Oct. 1 at 11:59 PM, ET)</p>
10	Mon., Oct. 2	<ul style="list-style-type: none"> <li>Recognize and draw the stages of mitosis</li> </ul>	<p><u>Before class:</u> GRQ-10 and Mastering-Lesson 10</p>

		<ul style="list-style-type: none"> <li>• Explain how cells know when it is time to divide or not divide</li> <li>• Describe where cell cycle checkpoints occur and why they are important</li> </ul>	
11	Wed., Oct. 4	<ul style="list-style-type: none"> <li>• Predict how mutations affect cell cycle progression</li> <li>• Interpret a histogram showing cell cycle data</li> <li>• Compare and contrast cell growth in normal cells vs cancer cells</li> </ul>	<u>Before class:</u> GRQ-11 and Mastering-Lesson 11
	Fri., Oct. 6	Continuation of Lesson 11	<u>After class:</u> Lesson 10 and lesson 11 quizzes on Gradescope (due Oct. 8 at 11:59 PM, ET)
12	Mon., Oct. 9	<ul style="list-style-type: none"> <li>• Describe the four main types of cell-cell signaling</li> <li>• Describe basic features of the signaling pathway of a water-soluble ligand.</li> <li>• Explain the events associated with G-protein coupled receptor signaling pathways</li> </ul>	<u>Before class:</u> GRQ-12 and Mastering-Lesson 12
13	Wed., Oct. 11	<ul style="list-style-type: none"> <li>• Describe how the MAPK signaling pathway can lead to cellular proliferation</li> <li>• Compare and contrast the intrinsic and extrinsic apoptosis pathways and how they correlate to cancer</li> <li>• Predict how inhibitors of the MAPK pathway can alter cell proliferation and apoptosis</li> </ul>	<u>Before class:</u> GRQ-13 and Mastering-Lesson 13
	Fri., Oct. 13	Continuation of lesson 13	<u>After class:</u> Lesson 12 and lesson 13 quizzes on Gradescope (due Oct. 15 at 11:59 PM, ET)
14	Mon., Oct. 16	<ul style="list-style-type: none"> <li>• Compare the phenotypes of stem cells and cancer cells</li> </ul>	<u>Before class:</u> GRQ-14 and Mastering-Lesson 14

		<ul style="list-style-type: none"> <li>• Describe how cell division plays a role in development</li> <li>• Explain how tissues can express different genes from the same genome.</li> <li>• Describe how reporter assays can be used to study gene expression in a tissue or organism</li> <li>• Predict how transcription factors can alter cell fate, and why this is potentially useful in the field of regenerative medicine</li> </ul>	
	Wed. Oct. 18	Continuation of lesson 14	<u>After class:</u> Lesson 14 quiz on Gradescope (due Oct. 22 at 11:59 PM, ET)
	Fri., Oct. 20	No class -- UNC Fall Break	-
15	Mon., Oct. 23	<p><b>**ASYNCHRONOUS CLASS**</b></p> <ul style="list-style-type: none"> <li>• Explain how methylation and acetylation of chromatin affect gene expression</li> <li>• Describe how methylation affects tumor suppressor or growth activating proto-oncogenes and the impact on the development/treatment of cancer</li> <li>• Compare the genome and the epigenome in terms of how they can/can't change easily and some impacts of those changes.</li> </ul> <p><b><i>This is an asynchronous lesson, which means that you do NOT come to class and instead watch the video and complete the activity on your own time.</i></b></p>	<p><u>Before class:</u> GRQ-15 (no Mastering this lesson)</p> <p><u>After class:</u> Lesson 15 quiz due on Gradescope (due Oct. 24 at 11:59 PM, ET)</p>
16	Wed., Oct. 25	<p><b>IN-CLASS ACTIVITY</b></p> <ul style="list-style-type: none"> <li>• Research a cancer-related gene to determine the type(s) of mutations that occur.</li> </ul>	<u>Before class:</u> GRQ-16 (No Mastering or quiz for this lesson)

		<ul style="list-style-type: none"> <li>• Describe the basic features of a molecular test(s) to evaluate if a patient has a mutation in a cancer-related gene.</li> <li>• Prepare a poster about the information collected about your cancer related gene and present it to a colleague in class.</li> </ul>	<u>After class:</u> unit 2 quiz due on Gradescope (due Oct. 25th at 11:59 PM, ET)
	Fri., Oct. 27	<b>EXAM 2 (lessons 9-16)</b> Students may have a single 8.5x11 sheet of paper with notes on both sides (no tape, glue, staples, etc.). Use this DOCUMENT for your notes and remember to include your name and PID in the designated location. To prepare for the exam, review: GRQs and class outlines, quizzes, and study guide found on the unit 2 page.	-

### Unit 3: How cells respond to stimuli and infection

Lesson	Date	Learning Objectives	Assignments
			(GRQs and Mastering are due at 10 AM, ET on the day of class. GRQs should be completed and submitted first before completing Mastering)
17	Mon., Oct. 30	<ul style="list-style-type: none"> <li>• Explain the Central Dogma of Molecular Biology and the flow of genetic information from DNA to protein.</li> <li>• Identify open reading frames (ORFs) in DNA and mRNA sequences</li> <li>• Compare and contrast a viral and bacterial infection</li> <li>• Predict the structure and function of aspects of the SARS CoV-2 genome and how this correlates to viral life cycle</li> </ul>	<u>Before class:</u> GRQ-17 and Mastering-Lesson 17

18	Wed., Nov. 1	<ul style="list-style-type: none"> <li>• Compare passive vs. active transport of a molecule across a membrane</li> <li>• Predict the movement of water across a semipermeable membrane</li> <li>• Compare and contrast endocytosis, exocytosis, phagocytosis, and pinocytosis</li> <li>• Predict the role of actin-myosin interactions in mediating endocytosis and exocytosis</li> </ul>	<u>Before class:</u> GRQ-18 and Mastering-Lesson 18
	Fri., Nov. 3	Continuation of lesson 18	<u>After class:</u> Lesson 17 and lesson 18 quizzes on Gradescope (due Nov. 5 at 11:59 PM, ET)
19	Mon., Nov. 6	<ul style="list-style-type: none"> <li>• Describe the four hallmarks of inflammation</li> <li>• Predict the location of immune receptors that initiate signal transduction cascades during innate inflammation</li> <li>• Review the molecular signaling events of a water-soluble hormone through a GPCR</li> <li>• Explain how the p38 MAPK pathway is involved in inflammation</li> <li>• Compare lipid-soluble and water-soluble hormone signaling pathways</li> <li>• Analyze and interpret cell signaling data</li> </ul>	<u>Before class:</u> GRQ-19 and Mastering-Lesson 19
20	Wed., Nov. 8	<ul style="list-style-type: none"> <li>• Compare and contrast various components of the extracellular matrix and different types of cell-to-cell interactions</li> <li>• Explain how CD4+ and CD8+ T cells are activated by peptide-loaded MHC molecules.</li> <li>• Compare and contrast cell-mediated and humoral immunity.</li> <li>• Describe the structural features of an antibody and how it mediates antibody</li> </ul>	<u>Before class:</u> GRQ-20 and Mastering-Lesson 20



		function	
	Fri., Nov. 10	Continuation of Lesson 20	<u>After class:</u> Lesson 19 and lesson 20 quizzes on Gradescope (due Nov. 12 at 11:59 PM, ET)
21	Mon., Nov. 13	<ul style="list-style-type: none"> <li>• Compare and contrast the cellular routes of a cytoplasmic and secreted protein.</li> <li>• Explain the role of the endoplasmic reticulum and Golgi apparatus in protein folding and post-translational modifications</li> <li>• Describe the role of the endomembrane system in antigen loading on major histocompatibility complex (MHC) class I molecules</li> </ul>	<u>Before class:</u> GRQ-21 and Mastering-Lesson 21
	Wed., Nov. 15	Continuation of lesson 21 content	<u>After class:</u> Lesson 21 quiz on Gradescope (due Nov. 16 at 11:59 PM, ET)
22	Fri., Nov. 17	Review for the unit 3 exam	<u>After class:</u> Unit 3 quiz on Gradescope (due Nov. 17 at 11:59 PM, ET)
	Mon., Nov. 20	<b>EXAM 2 (lessons 17-22)</b> Students may have a single 8.5x11 sheet of paper with notes on both sides (no tape, glue, staples, etc.). Use this DOCUMENT for your notes and remember to include your name and PID in the designated location. To prepare for the exam, review: GRQs and class outlines, quizzes, and study guide found on the unit 3 page.	-
	Wed., Nov. 22	No class -- Thanksgiving break	-
	Fri., Nov. 25	No class -- Thanksgiving break	-

## *Unit 4: Infectious disease testing and vaccines*

Lesson	Date	Learning Objectives	<b>Assignments</b> (GRQs and Mastering are due at 10 AM, ET on the day of class. GRQs should be completed and submitted first before completing Mastering)
23	Mon., Nov. 27	<ul style="list-style-type: none"> <li>Describe how to generate cDNA from an mRNA template</li> <li>Compare and contrast the applications of quantitative reverse transcriptase PCR (qRT-PCR) and enzyme linked immunosorbent assay (ELISA)</li> <li>Evaluate data to determine if an individual is infected with SARS CoV-2</li> </ul>	<u>Before class:</u> GRQ-23 and Mastering-Lesson 23
24	Wed., Nov. 29	<ul style="list-style-type: none"> <li>Compare active and passive immunity</li> <li>Predict the immunological events that take place when an individual receives a vaccine and how vaccines provide protection against pathogens.</li> <li>Compare and contrast the molecular events of the Central Dogma of Molecular Biology that take place in the Johnson &amp; Johnson vs. mRNA vaccines</li> <li>Evaluate data to determine vaccine efficacy</li> </ul>	<u>Before class:</u> GRQ-24 and Mastering-Lesson 24
	Fri., Dec. 1	<b>ASYNCHRONOUS</b> Continuation of lesson 24	<u>After class:</u> Lesson 23 and lesson 24 quizzes on Gradescope (due Dec. 3 at 11:59 PM, ET)
25	Mon., Dec. 4	<ul style="list-style-type: none"> <li>Compare and contrast the molecular techniques discussed in class and their applications</li> <li>Review for final exam by completing a molecular case study</li> </ul>	No GRQ or Mastering assignment for lesson 25

	Wed., Dec. 6	Continuation of lesson 25	<u>After class:</u> Unit 4 quiz on Gradescope (due Dec. 6 at 11:59 PM, ET)
	Sat. Dec. 9 from 12- 3 PM	<b>FINAL EXAM (CUMULATIVE)</b>  Students may have a single 8.5x11 sheet of paper with notes on both sides (no tape, glue, staples, etc.). Use this DOCUMENT for your notes and remember to include your name and PID in the designated location. To prepare for the exam, review: GRQs and class outlines, quizzes, and study guide found on the unit 4 page.	-