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Welcome to Biology 101!

Biology 101 is an introduction to biology at the college level that is intended to serve both majors and non-majors. It is assumed that students in this class do not have a practice with biology and that any prior experience is likely to be several years ago. BIOL 101 students are expected to take a very active role in their learning by completing reading homework before watching lecture videos, ready to participate directly with peers during live review sessions and peer instructor sessions and through Mastering Biology Learning Catalytics technology, and reviewing routinely for quizzes and exams. In this highly-structured course, we have evidence that every student can achieve if they are motivated to be learner!

Note: The professor reserves the right to make changes to the syllabus, including project due dates and test dates (excluding the officially scheduled final examination), when unforeseen circumstances occur. These changes will be announced as early as possible so that students can adjust their schedules. The professor also reserves the right to update the syllabus during the semester.

Due to COVID-19, this course will run remotely during the Fall 2020 semester. *Each week, students will complete asynchronous lessons that will require submission of a variety of assignments.* Students are responsible for all material covered in the assigned readings/GRQs (guided reading questions) and other multi-media sources, videos, and online assignments assigned for each lesson. Dr. Garland will hold synchronous (whenever possible) open office hours / review sessions via Zoom during part of the normal class time (1:15-2PM) starting the second week of the semester. While these synchronous sessions are not required, students are strongly encouraged to attend. The open office hours / review sessions are a great time to ask questions on course material. Additional office hours for personal questions are available via the Sign-Up feature of Sakai (see tab on left) to schedule an individual appointment.

About the Professor and Office Hours

Class Meeting Information

Official Class time: Tuesdays and Thursdays 1:15-2:30PM. Exams will be given during class time, but lectures will be asynchronous (pre-recorded) and posted by 9AM the day of class.

Review Sessions / Open Office Hours with Dr. Garland: Thursdays 1:15-2PM. These sessions will be synchronous (live) whenever possible. <https://unc.zoom.us/j/9349499002>

Be sure to log into Zoom with your official UNC onyen.

Location: Classes are asynchronous (recorded) and will be available by 9 AM the day of class.

About the professor and office hours

Professor: Dr. Alaina Garland

Email: agarland@email.unc.edu

[Dr. Alaina Garland](#) (agarland@email.unc.edu) is a Teaching Assistant Professor in Biology, teaching Biology 101, 202, 205, 252, and 449. She has a PhD in Microbiology and Immunology from UNC-CH and taught for several years at the University of Washington in Seattle prior to being hired in her current position at UNC. She is passionate about educating students in biology and helping them to achieve their professional goals. **Preferred Name:** Dr. Garland ("GAR-Lund")

Office Hours: Thursdays 1:15-2PM as group review sessions and Mondays 11:30-12:30 via individual appointment (10 minute slots) via the Sign-Up tab on Sakai. If you need to see Dr. Garland outside of these hours, please email to set up an alternative time.

Nervous about office hours? Don't feel intimidated if you've never been to a professor's office hours. You can come alone or sign-up with a friend. You can come in to talk about study skills, mental health issues, your background, your career, advice for future courses to take, etc. I'm an advocate for Covenant students, Chancellor Science Scholars, first generation students, transfer students, international students, continuing education students, BIPOC, Latinx, and other underrepresented minority students, LGBTQIA+ students, students from diverse socioeconomic backgrounds, military-connected students, first year students, sophomores, juniors, seniors, students with silent disabilities, students that just want to say hi ...ANY student!



Did you know? Asking for help is a sign of strength and self-care! Please ask for help early and often! Small problems are easier to cope with than escalated issues, please do not wait until the end of the semester to ask for help.

Reserving a time to meet: Check "Sign-up" tool on Sakai to reserve a slot. Come alone, or come with a friend. I may add additional hours some weeks as my schedule allows.

Peer Mentors and Supplemental Instruction

Peer support via Piazza: I'll have hundreds of students this semester and know I cannot give you all the individual attention you deserve. I'll ask that you become a community of scholars to help answer questions about the course logistics and course content. One tool we will use to help us accomplish this is Piazza. I and the instructional team will be checking and responding to Piazza inquiries periodically, but it is expected that you will answer each other's questions. I'll be taking notice of students who are engaging on the site! To access the Piazza site, visit: piazza.com/unc/fall2020/biol101

Peer Instructor Support via Zoom:

We have a large team of students who have completed and excelled in Introductory Biology who will be available to support you this semester. You will be matched with one peer instructor who will give you their tips and guidance for the semester. You will probably want to attend their session(s) each week. **However, you are**



attend as many peer instruction sessions with as many different peer instructors as you want.

Peer instructors will only offer virtual sessions through Zoom this semester; no in-person sessions will be held. Except for designated exam review sessions, peer instructors will sessions -- **plan to attend live!**

You will earn course participation points for attending 9 sessions of peer instruction out of the total offered over the semester (credit is given for 1 per week, meaning you credit by attending all 9 sessions in the final week of class!)

What can you expect from the peer instructors?

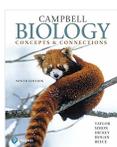
- We will soon be posting when sessions will be held each week. There will be at least 10 hours of review and tutoring available for you to pick from each week!
- Peer instructors will host a blend of structured review (with questions for you to practice) and answering questions that you will bring to the session or post to Piazza before.
- The sessions will be conducted live via Zoom, but not recorded.
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Why should you attend these sessions on a regular basis? We have data that suggests that students who attend score on average a half a grade better than peers who don't suggest you fit one into your schedule early in the semester and attend weekly as if it is a course requirement (which it partly is!)

Bio Cell with Biology Specialist: Feel you need a more basic review and more in-depth help? Attend these weekly sessions sponsored by the Learning Center. (Robin Blanton, rcb@email.unc.edu). Learn more by visiting: <https://learningcenter.unc.edu/services/stem/bio-cell-2/>

Required Resources

Textbook and Digital Access: *Campbell Biology, Concepts and Connections, 9th Edition with Mastering Biology, ebook access, and Learning Catalytics* by Taylor Dickey, Hogan, and Reece.



The UNC bookstore will email you before the first day of class with details about what to purchase so you have access on the first day (you can also get 14-day free access without payment to allow immediate access if you are waiting for payments to come through). Ultimately, you will need access to Mastering Biology (online Catalytics (online) and some form of the book (either ebook or physical, or both). We have worked closely with Pearson and the UNC Boostore to provide you with cost-effective options. Note: there are hard-copy books on reserve at the Undergraduate Library.

COURSE CODE for Fall 2020: garland31519

Instructions for registering for Mastering Biology (which includes Learning Catalytics) can be found in the attachment below titled "Mastering_Student_Registration_Handout_garland31519.pdf"

Required reading: Particular chapters are required (see Guided Reading Questions—GRQs— for specific details on exactly which pages you should be reading and what topics you focusing on in particular). You should read and answer the GRQs **before** completing Mastering Biology homework assignments.

 [Student_Registration_Handout_garland31519.pdf](#)

How to attend class every day

1. **Before class -- complete Guided Reading Questions (GRQs)** that you finished before class and can use as a reference. You will find the blank GRQs (labeled with the assigned readings for each) on Sakai. You may only submit your GRQs as a PDF or Word document to GradeScope. Assignments submitted as Pages (Apple product) will not receive credit.
2. **Before Class and after the GRQs -- Complete the Mastering Biology homework assignment.** This should be done after reading the text and completing the GRQs.
3. Log in to Sakai and click on the "Lesson" tab for the day.
4. While engaging with the class material:
 1. **Have a computer or tablet**
 2. **Remained logged into Sakai**
 3. **Log in to Learning Catalytics and open the day's session**
 4. **Make sure you have a blank Class Outline which you will find linked in the Lesson for the day.** I recommend that you print the document and take notes by hand, but you can write/draw on works too. Note: Educational research shows that students in a highly structured course like this learn more by handwriting notes.
 5. **Have extra blank paper for drawings, notes, activities, etc.** A tablet also works.



Note: I encourage you to not rely on cellular service and instead have your device connected to Wifi. If you are using UNC-Wifi, check out this resource for connecting your device: <http://help.unc.edu/help/connecting-to-the-uncnetwork-getting-started/>

Course Components Making Up Final Grade

As your instructor, I value and appreciate your constructive feedback on my teaching and design of this course. While I hope you will complete the official course evaluations at the end of the semester, I also appreciate your feedback earlier so that I can make changes, if appropriate. I have therefore created an **anonymous survey** for you to share your experiences in BIOL 101. If there is something that you are enjoying about my teaching or this course, please share! Alternatively, if there is something you think I could do better, please share an alternative approach or solution. While I may not be able to make all suggested changes, I promise to read and reflect on all feedback that you provide. You can access this survey at: <https://forms.gle/pGZPienvfELaDHMM6>. This survey will remain open all semester and I welcome you to submit as many responses as you wish.

Homework via Mastering Biology (9% of your grade): Homeworks will be due generally every Monday and Wednesday night by 11:55 PM (see detailed schedule). Some assignments take you as little as 20 minutes and others will take over an hour with the animations and short tutorials interspersed in the homework. It is your responsibility to start it in a timely manner and you finish it by 11:55 PM. ****I recommend submitting your work at least 20-30 minutes before the due time to account for internet or loading issues**** **Late homeworks will receive credit** even though you can still do them for practice. See my Goal #1 below and realize that I am trying to help you to succeed by giving you these regular assessments. Assignments are due a week before they are due. Note: These questions are often lower level and not equivalent to exam questions. They are meant to help you learn/practice.

Quizzes via Mastering Biology (9% of your grade): You will be required to do online timed quizzes in Mastering Biology (Quizzes). These are meant to give you practice for answers to questions in a timed situation, more predictive of how you might do on an exam than a typical HW. Missed quizzes = 0%. Unlike other assignments, quizzes post only about 3 days are due. I recommend marking your personal calendar with these due dates today!

Notes:

- Once a quiz is started you must complete it and you cannot go backwards to edit previous questions.
- Students registered with ARS who receive extended time will receive accommodations on quizzes too. Please make sure you email Dr. Garland to make sure your account is added to your quizzes!
- Access Mastering at: www.pearsonmylabandmastering.com (Instructions for registering are delivered via email from the UNC Bookstore.)

Participation (7% of your grade): Most of this grade will come from Learning Catalytics (4%), but attendance at 9 peer instruction sessions during the semester, completion of pre-surveys, GRQs submitted to GradeScope and small group work will also be a part of participation grades (3%). To participate, we'll use Learning Catalytics (accessed through Mastering through your smart device. Note: these questions are to be done during the video lessons and students should only complete the questions they are instructed to (e.g., don't work on questions to the end). These are graded for effort BUT they are often practice exam questions and a good way for you to gauge your understanding of the material.

How is LC graded? The self-paced LC questions will be open for 48 hours (12 noon Tuesday to 12 noon Thursday and 12 noon Thursday to 12 noon Saturday). Question participation-based (not graded for correctness). A few points will be dropped for all students to accommodate occasional absence, tech problems, athletic travel, lateness, etc. Do not email me to tell me you were absent; we will have so many opportunities for participation that missing one day in the semester will not affect your grade (I will end up dropping points for every student to make accommodations for this for ALL students). If you have multiple, excused absences or an extended illness please make sure I know (see in excused absences below under Individual Exams).

How are GRQs graded? GRQs are graded for completion. They should be completed before doing Mastering assignments and must be uploaded via GradeScope by 11:59 before class (Monday and Wednesday). **I recommend submitting GRQs 20-30 minutes before the deadline to allow for loading and internet issues**. You must submit them as a PDF or a Word document. If you take a picture of a figure submit as a JPEG. Assignments submitted as Pages (an Apple product) will not receive credit. I also recommend labeling your files with the matching GRQ number. If you accidentally submit the wrong GRQ file to the wrong assignment you will not receive credit for the assignment. Missed upload? No worries. You will be able to drop three missed GRQs from your grade.

Individual Exams (75% of final grade): There will be three mid-semester exams given during the regular semester, and a cumulative final exam. The format will be multiple choice and exams will be administered via Gradescope, which students will access via Sakai and their phones. Only the final exam is cumulative, although some objectives around critical thinking skills will be tested on each exam. Each semester exam will cover the material specified on the course schedule. For all exams, you will need your PID number as identified on the exam sheet. Exams will be open from 1PM - 3PM EST the day of the exam, but students will have 75 minutes to complete the exam once you open it.

**Students who use ARS: Please email me about your accommodations so I can make the necessary adjustments in Gradescope.

Make-Up Exams. You may only be excused from an exam (and eligible for a make-up) if the Dean of Students excuses your absence. Information about excused absences can be found at <https://odos.unc.edu/student-support/class-absences>. If you find that you are going to miss an exam for a University sanctioned excused absence please let me know immediately and be prepared to show documentation. Make up exams for students who qualify will be entirely different (and potentially in a different format) from the exams given in class and must be completed within an academic week of the original exam date.

How Is Your Grade Determined?

If you take all three semester examinations:

The lowest exam grade is dropped and the total for the semester = $(0.25 \times \text{exam}) + (0.25 \times \text{exam}) + (0.25 \times \text{final exam}) + (0.09 \text{ homework average}) + (0.07 \text{ participation score})$

If you take any two semester exams:

Both the exams you took will count and the total for the semester = $(0.25 \times \text{exam}) + (0.25 \times \text{exam}) + (0.25 \times \text{final exam}) + (0.09 \text{ homework average}) + (0.07 \text{ participation score})$

Converting your final average to a letter grade:

A = 93-100	C+ = 77 – 79.9
A- = 90-92.9	C = 73-76.9
B+ = 87- 89.9	C- = 70-72.9
B = 83-86.9	D = 60-69.9
B- = 80- 82.9	F = 59.9 or less (or a score of 45% or less on the final exam)

Note: there will be no changes to HOW your final average is calculated at the end of the semester...so please don't ask. With over 300 students, many of you may be close to the cut-off but there have to be grade cut-offs. I unfortunately can't make exceptions for individual students since that would be incredibly unfair to the rest of the class who also worked hard.

Common Student Concerns:

Many students have been told that Biol 101 is a "weed out" course. Of course this is not true, but why does it have this reputation?

In fact the average grade in this class is in the C+/B- range; this is not bad-- it is average. Yet, students also earn D's and F's in this class. This is absolutely shocking to first-year students who have, in the past, received A's in their high school classes for memorizing course material.

You may also be wondering...is there a pre-determined number of students that receive a C, D, or F?

Absolutely not. In theory, if the whole class earns A's, then the whole class is given A's. So why don't all students do as well as they think they will when they walk into class the first day? My experience tells me that:

1. Some students do not have the active learning and studying skills that they should already have at the college level (It often takes these students an exam or two recognize this.) We can fix this together.
2. Some students do not actually put in the effort that is necessary (even though they may think they are putting in a big effort). You can fix this if you are honest with

We genuinely want you to do well, which is why this course is SO highly structured. We use the best education research to inform how we craft our classes. It would be much simpler if we assigned readings and then ask you to watch the lectures, but that way does not help most students to LEARN, which means students then struggle on the exams and don't retain information or build a conceptual framework of biology in their minds.

A Few Other Notes

Digital Etiquette: This course will be entirely online will require you to access recorded videos via and other online resources (Learning Catalytics). You will likely have ample distraction. Research suggests that the human brain is not as excellent as multitasking as we think it is. Please be respectful of your own learning and focus and hold yourself accountable. Please engage with course material in an environment devoid of distractions, which may include (but is not limited to) family and friends, other virtual media (e.g., social media or TV), etc are "in class", make sure that your use of digital is limited to course content only. You will learn more if you concentrate on the course while you engage in the course material in free of distractions.

Additionally, because you will have the opportunity to participate in synchronous sessions with either me on Thursdays or with the peer instructors on various other days, please be professional in your environment when you log onto a Zoom session. Again, try to select a location that is devoid of distractions. Further, please keep yourself on mute when not talking to ensure you are heard for all on the call, but keep your video ON. Students should be using their UNC Zoom account to log into these sessions and please update your profile to include: your full name, pronouns, and a picture of yourself. This will help me and others on the instructional team learn your name and get to know you further. See an example picture below and visit the details on setting up your UNC Zoom account: <https://software.sites.unc.edu/zoom/>

Should you take notes by hand or type? Research suggests taking notes by hand (paper or tablet) is the way to go in a highly structured course like this! You will have class on video so you should write and draw on. Much of biology is about drawing, so typing just won't be useful. No matter how messy your handwriting or notes are -- TAKE NOTES BY HAND! PowerPoints will be posted when the videos become available and will be useful for review purposes.

Sakai Site (you will need your onyen to log on): This site will have postings from my lectures such as outlines, power point slides, and supplemental material I mention in lecture. Please post announcements/send emails regarding student concerns on this site. **It is your responsibility to check it and your UNC email account daily for any course announcements.**

Groups

Students learn more when they work in small groups of peers to discuss issues and solve problems*. We will have two kinds of groups in BIOL 101.

TEAM

You will be part of a TEAM (approximately 30 individuals) assigned to a peer instructor. We hope that you will be able to attend peer instruction with this group of 30 on a weekly basis to get to know one another and your peer instructor. You are welcome to attend any peer instruction session during a week, but we hope that you spend time with your team to support your learning and theirs.

SMALL GROUP

Later in August, after you've hopefully gotten to know your teammates, I will assign you to a SMALL GROUP within your team. This will be a group of approx. 5 individuals. The SMALL GROUP will be your study buddies and your sounding board.

The goal for both the TEAMS and SMALL GROUPS is to encourage community building within this large course. We know from the education literature that community within a course is a major contributor to students' success. It's easy to do this when we are in class, as you can easily turn to your neighbor and have a conversation. In an online class, you may find it difficult to do this so we want to avoid as best we can. By having a TEAM and SMALL GROUP to turn to, you have a support system to support your learning (and for you to support theirs).

**If your assigned group is not working out a few weeks into the semester, please contact me and I'll help figure out a solution (a different group, a different team, etc).*

Collaborating with others is an important skill in all professions, and we are available to help you to solve interpersonal problems that may arise within your group. If you are experiencing difficulties with your group members, you may decide to invoke the "Terminator Clause." When you work in a group, it is possible that some team members will contribute more than will others. This can be a critical problem if one person demonstrates a lack of commitment to the team (e.g., failing to contribute to group assignments). In such an instance, we reserve the right to remove that member from the team. Please notify Dr. Garland ASAP if your group is not working out.

Course Goals

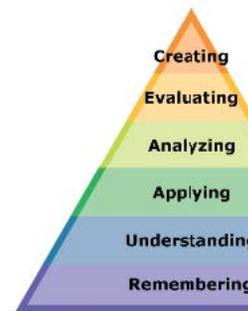
1. This course should prepare you to succeed in future science courses. You should learn how to be an active learner in the lecture hall and you should learn how to be an active learner in the laboratory. Educational research has shown that students in this course who do reading/ homeworks before class, actively participate in class, and review notes regularly can and will succeed in future science courses. Are you underprepared because of your science background? The course is designed to equalize your readiness before class—while you may take several hours reading and preparing, others may need less time. Yet when you get to class, your effort will pay off as we practice these concepts together and you gain confidence in your ability! How do you know you are learning? When you make mistakes, you identify what you don't know. **Making mistakes is KEY to learning.** It makes more sense to make mistakes on homeworks and in-class when the stakes are low rather than on an exam, right?

And what if you don't plan to take any more science classes? Active learning and studying are skills needed for any discipline. You can achieve these goals through practice. Most students at college are very skilled at remembering and understanding (regurgitating memorized information.) True learning will take place when you are challenged to apply, analyze, evaluate, and create. This will challenge you to do this. You might find this difficult and uncomfortable (most of us, myself included, do), but you will be learning! When you enter your first job out of college, your supervisor will say "Thank goodness you are here - we really need someone to memorize this textbook." They will ask you to come up with solutions to problems, to troubleshoot, to think creatively. These are the things we are practicing over and over in this course. I want to help prepare you to be amazing at whatever it is you choose to do after you leave UNC!

2. This course should provide you with the concepts and skills that make up the scientific field of biology. For those of you continuing in biology, this is just the tip of the iceberg. For others, this might be your one and only biology course! Our goal will be to touch upon many topics, finding common themes in the chapters we cover. Thoroughly learning the principles is about making connections between material learned at the beginning, middle, and end of the semester! Practice is key to building a foundation of knowledge (and that is why you do Guided Reading notes, Mastering Biology, Learning Catalytics Questions, quizzes, SI, etc.).

Specifically, by the end of the semester you should be able to:

- Identify examples and name FIVE core themes of biology
- Evaluate a scientific study and determine if its design is sound so as to evaluate science around vaccines, pseudoscience, etc.
- Make conclusions from data and draw graphs and models from data/information given to you.
- Describe the new properties that emerge at each level of hierarchy of life (from small organic molecules through ecosystems and some ways these systems are kept in balance.
- Explain what "food" is and compare and contrast animals and plants in how they obtain and transform the matter and energy.
- Describe the flow of information in various signaling pathways and in the flow from DNA to proteins.
- Explain how life on earth evolved and how adaptations relate to survival, reproduction, and intra- and inter-specific interactions.
- Detail examples of adaptations in the animal body in which "structure fits function" at the cellular and whole body level



3. This course should excite you about biology. Throughout the semester I hope you will ask yourself and me, why is this relevant to me? Some lessons w obvious as they relate to health and medicine. I hope that the biology that we learn this semester will cause you to ask more questions. You might even leave questions than answers! There may be times where I don't know the answer, as biology is a rapidly evolving field and we as biologists are learning more and day. Regardless of your future plans, my goal is for you become excited about biology and empower yourself to learn more!

How will you THRIVE this semester?



I believe students thrive when they:

- Take full advantage of the breadth and depth of our curriculum
- Set academic and personal goals
- Take responsibility for their education, choices, & decisions

How successful students have done well in this course: They...

1. always read the textbook for each corresponding homework while answering Guided Reading Questions (GRQs). They pay attention to what they are reading and reflect on w unsure about. They do NOT spend time making their own extensive outlines - they use the GRQs only.
2. complete their Mastering Biology homework assignments with plenty of time to make mistakes and think through the questions. They are not too focused on the grade they get because they value the homeworks and videos as a learning tool.
3. complete each class session on-time! They stay engaged by hand-writing notes and attempt each learning catalytics question as it comes up.
4. attend peer instruction sessions and interact with other students; they encourage their classmates to participate and learn
5. are brave and vulnerable. What do I mean? They are willing to make mistakes, take chances drawing a model wrong, are willing to attempt questions by themselves before ch peer, are willing to talk to a classmate they don't know.
6. review after each class for about 15-20 minutes to reflect on what was learned and what they still have questions about.
7. study before each Mastering Biology quiz and practice exam, so as to prepare for them like a real exam.
8. review (on their own) every question from Mastering HW, GRQs, Quizzes, Learning catalytics, class, etc. to see if they could TEACH it to someone else. Successful students d get the right answer and move on, they are able to explain how someone arrives at this answer.
9. attend S.I., mentoring hours, tutoring hours, or study groups routinely because once they have done the work alone, they can collaborate and learn even more from others. (T and peer instructor sessions to meet peers.)
10. have a system for planning and keeping track of all deadlines.
11. are able to state what resources are available and where to find them.

Know Your Resources: Assignments/schedule are on the following pages. All hours for office hours, peer instruction, tutoring etc. will be posted on the front page of Sakai. Chan out via announcements. All materials you need (GRQs, outlines, powerpoints, old exams) are found through the Lessons tab on Sakai (and available in the Sakai resources folder click on a link in resources or lessons and get an error message (generally a 403 error), it is likely because that particular resource is not available yet, This would occur if you try lecture from Unit 2 right now, because they're not posted yet!

I Want to Help You: Reach me through office hours or by email. I really enjoy getting to know my students, and am nobody to be scared of!! Come see me after the first exam if y well. I will have much better suggestions for you if you do not wait until you did poorly on all three exams to ask for help!

How to prepare for an exam? Use the learning objectives to guide your studying -- the learning objectives will be the criteria in which I will assess your learning. When I write an I specifically link it to a learning objective -- use these as a resource. In addition, use GRQs, class outlines, Learning Catalytics questions, Power Point slides, practice exams, etc explain, draw, compare etc. (See following page with ideas about how you demonstrate you know something.) READING is NOT studying (studies show it actually gives students security because things "look familiar" even if they don't understand it fully). Studying involves blank paper, explanations, drawings, etc. Again, DO NOT TRY TO MEMORIZE EV the textbook. We focus heavily on what we want you to know in your assignments/practice exams and in lecture, so that's where you should be focusing most of your energy. Don importance of sleep before an exam!

Uphold the honor code. Academic integrity is at the heart of Carolina and we all are responsible for upholding the ideals of honor and integrity. The student-led Honor System is adjudicating any suspected violations of the Honor Code and all suspected instances of academic dishonesty will be reported to the honor system.



Diversity is Valued. The Department of Biology values the perspectives of individuals from all backgrounds reflecting the diversity of our students. We broadly defin include race, gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. We strive I classroom and this department an inclusive space for all students.

We always put an official diversity statement on our syllabus, but especially given current events, I want to emphasize that I, as an individual human being, **TRULY BE personally am a better human being for knowing the wonderful, amazing, and diverse students that we have here, and I'm so grateful and honored that I get to hear you help you in your UNC journey. I want all students to feel safe and heard in this classroom (even though it's virtual).**

Your grade includes participation components (see also section on Assigned Work & Participation) because **you are responsible for contributing to the educational experience the course**. When interacting synchronously or asynchronously, please be sure to demonstrate respect and sensitivity for your classmates. This means using non-judgmental language, others time to express themselves in group work, and accepting that intelligent, mature & ethical people may hold differing viewpoints, and this is okay (and even good). We bring of diversity with us into the classroom (different ethical frameworks, values, personal experiences, family structures, physical abilities, intellectual strengths, religious backgrounds affiliations, personal identifications, etc.). This **diversity is a strength** - it allows us to more richly experience the spectrum of human experience through our work together.

Below are a few example guidelines (from CRLT University of Michigan) for both students and faculty to follow when interacting with others to create an environment that supports learning.

- **Step up, Step back:** Be aware of how much you are contributing to in-class discussions. Try not to silence yourself out of concern for what others will think about what you say idea, don't wait for someone else to say it; say it yourself. On the other hand, if you have a tendency to contribute often, give others the opportunity to speak.
- **Show Respect by Giving your Attention:** Don't interrupt, engage in private conversations, or turn to technology while others are speaking. Use attentive, courteous body language when engaging remotely. Keep your video on when you can and keep focused on the screen.
- **Let Curiosity Open your Mind:** Understand that there are different approaches to solving problems. If you are uncertain about someone else's approach, ask a question to express uncertainty. Listen respectfully to how and why the approach could work and respond based on that, not on your preconceptions.
- **Create the Environment you Need:** Make an effort to get to know the other students, especially in your small groups. Introduce yourself and make a point to share the pronoun name and your preferred pronouns. Refer to classmates by name and make eye contact with other students (via the screen).

Broadly speaking, over the course of your college career, it is expected that you will engage with topics that you may find emotionally challenging or unexpectedly difficult. It's part of this to make you feel uncomfortable, and entirely appropriate for you to reach out to me and/or your friends to talk about that. But please do remember a college education is *not* meant to confront you with things that challenge and at times even threaten your world-views. This is actually one of the privileges of an education. So, if you feel intellectually or emotionally challenged by what you learn in class, that's not necessarily a bad thing. It may only mean that you are engaging with novel perspectives, which is what college is all about.

As for topics that are not just challenging, but are possibly triggering: I know that some of us have trauma in our background and may need to seek extra support around topics that trigger those painful experiences. So while I do not offer specific trigger warnings, I value making sure that each of my students is able to engage fully with the course and I trust my students to reach out to me for support as needed.

Please contact me with any issues via email or via the anonymous feedback form. I welcome and value your input! <https://forms.gle/tAfJrnoASDKdP5536>

Approach to Class Meetings

Before each lesson:

- Download **Guided Reading Questions (GRQs)**. Printing is optional.
- Complete readings and questions listed in the GRQ file.
- Upload your completed GRQ file to **GradeScope** (Submit by 11:55 PM on the day before class -- Monday and Wednesday). Submit your file as either a WORD document, PDF or submit an Apple Pages file. Please access GradeScope via Sakai.
- Complete assignments in **MasteringBiology** (due by 11:55 PM on the day before class -- Monday and Wednesday).
- Check **Piazza** to stay up-to-date on current discussions about the class
- Check **Sakai** announcements and your **UNC email** frequently (at least once per day) to stay up-to-date on class communication.

During the lesson:

- Be prepared to access your completed GRQs document.
- Download a blank **Class Outline**. We recommend you use this to take notes. Printing the document is recommended so that you can draw diagrams when asked. Prepared notes -- you can re-write your notes after class. Your notes should be messy because you will make mistakes and that's ok!
- Watch the **Lesson Videos** in order. They are available in the Resources Folder.
- Log in to **Learning Catalytics** and open up the day's session. Be prepared to answer all the questions posed to you without looking at your notes.
- Keep a running list of questions you have about the current topic (these are a study guide)

After Class

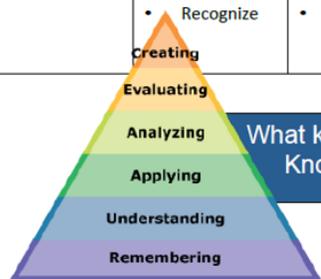
- Review **lecture slides** (available when lesson videos are posted) and your mastery of each learning objective
- Review **course schedule** for approaching due dates
- Review, post, and/or respond to questions in Piazza
- Attend a review session with:
 - **Peer Instructors** (via Sakai Sign Up)
 - **Learning Center**
 - [BioCell](#)
 - [Peer Tutoring](#)
 - [Academic Coaching](#)
- Meet with your **TEAM** or **SMALL GROUP** and discuss topics that you are not clear about
- Schedule **Office Hours** with Dr. Garland when needed (via Sakai's Sign-up tool)
- Attend live sessions with your instructor or look over the review slides posted.
- Clean up your lecture notes and identify areas of uncertainty → these are questions you can ask!

Be Active in your Studying

Words to implement when you study.

When studying, try drawing, contrasting, arranging, etc.

Type (Level)	Knowledge (1)	Comprehension (1)	Application (2)	Analysis (3)	Synthesis (3)	Evaluation (3)
Bloom's Definition	Remember previously learned information.	Demonstrate an understanding of the facts.	Apply knowledge to actual situations.	Break down objects or ideas into simpler parts and find evidence to support generalizations.	Compile component ideas into a new whole or propose alternative solutions.	Make and defend judgments based on internal evidence or external criteria.
Verbs	<ul style="list-style-type: none"> Arrange Define Describe Duplicate Identify Label List Match Memorize Name Order Outline Recognize 	<ul style="list-style-type: none"> Classify Convert Defend Describe Discuss Distinguish Estimate Explain Summarize Generalized Give example(s) Identify Indicate 	<ul style="list-style-type: none"> Apply Sketch Choose Compute Demonstrate Discover Dramatize Employ Illustrate Interpret Write Modify Predict 	<ul style="list-style-type: none"> Analyze Appraise Breakdown Calculate Categorize Compare Contrast Criticize Diagram Differentiate Relate Distinguish Examine 	<ul style="list-style-type: none"> Write Rewrite Categorize Reorganize Combine Comply Compose Construct Create Design Develop Formulate Explain 	<ul style="list-style-type: none"> Predict Argue Assess Justify Interpret Compare Conclude Contrast Defend Describe Judge Estimate Evaluate



What kinds of questions do you have trouble with on quizzes/exams? Knowledge or application? Practice what you have trouble with.

Course Schedule

Course Schedule & Topics for Discussion

For each lesson, you have a "Guided Reading Assignment (GRQ)" found on Sakai with the same title that you should do **before** doing Mastering Homework. (GRQs will give you pages to read from the text, etc). The GRQs are due in GradeScope by 11:55 PM the night before each class.

The idea is that Mastering will reinforce what you have independently learned from the reading. If you simply hunt and peck through the text to find the answers without doing the missing a large chunk of information I expect you to be familiar with. You are ultimately responsible for information in GRQs as if these have the lecture content. Not doing these = least a third or one-half of the course content.

Due dates may change due to unforeseen circumstances (hurricanes, etc) but exam dates will not change unless the University is closed. Late homework assignments = 0%. **Turning in Mastering AND GRQs 20-30 minutes before the posted deadline to account for possible uploading and WiFi issues.**

UNIT 1: BIOCHEMISTRY & CELL BIOLOGY

Learning Objectives:

- What makes science, science?
- How are the macromolecules of life (matter) put together, utilized, and broken down in a cell?
- How is energy transformed in the process?

Date	Lesson Assignment	Lesson Objectives
	<p>Due 11:55 PM on the night before class, unless otherwise noted**</p> <p>Do GRQs first (readings listed in GRQ) and then do Mastering. (All GRQs turned in via Gradescope)</p>	
Tues. Aug. 11	<p>Lesson 0</p> <ul style="list-style-type: none"> • Register for Mastering with your UNC email account • Print/read syllabus and schedule • Familiarize yourself with the Lessons tabs in Sakai 	<ul style="list-style-type: none"> • Reflect on ideas about what makes a class inclusive for all learners. • Reflect on the kinds of concepts you will learn in class by completing the pre-test. • Describe the expectations for being prepared for our future classes

<p>Thur. Aug. 13</p>	<p><u>Lesson 1</u></p> <p>GRQs first and then Mastering assignments both by the names:</p> <ol style="list-style-type: none"> 1. Introduction to Mastering 2. Exploring Life and the Process of Science <p>Be sure to download and fill out the class outlines while watching class videos.</p>	<ul style="list-style-type: none"> • Distinguish science from unjustified claims and explain how science is iterative. • Describe elements of research design and how they impact scientific findings/conclusions (e.g. identify strengths and weaknesses in research related to bias, sample size, randomization, experimental control) • Interpret data and choose best way to communicate data in graphs. • Formulate a testable hypothesis and design a controlled experiment and explain the necessity of replicates.
<p>Tues. Aug. 18</p>	<p><u>Lesson 2</u></p> <p>GRQs first then and Mastering assignment:</p> <ul style="list-style-type: none"> • Macromolecules: Structure and Function 	<ul style="list-style-type: none"> • Name and explain the five major themes of biology. • Classify polysaccharides based on their structure/function in plants and animals and describe how monomers join to form them. • Define lipids and explain their functions and properties in polar or non-polar solvents. • Draw protein structure and depict the consequence of mutations on normal structure and function. • Explain the molecular forces that hold protein structure together and how they can be disrupted. • Identify how the human body uses macromolecules from food.
<p>Thur. Aug. 20</p>	<p>Research Consent Participation Form (on Gradescope)</p> <p><u>Lesson 3</u></p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> • A Tour of the Cell 	<ul style="list-style-type: none"> • Predict structures of the prokaryotic cell that would be antibiotic targets. • Describe how a protein is synthesized and exported from a cell how disease can be caused when this process goes awry. • Explain how insulin-producing cells are like dysfunctional factories when a person is diabetic (type 1 or type 2).
<p>Thurs. Aug. 20</p>	<p>LIVE Review Session with Dr. Garland 1:15-2PM</p>	
<p>Thur. Aug. 27</p>	<p>Quiz 1 (on Mastering; timed; only one try per question on quizzes, do quiz before lesson 4)</p> <ul style="list-style-type: none"> • Note: Quizzes only post about 3 days before they are due. <p><u>Lesson 4</u></p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> • Structure and Function of Membranes <p>Note: Due to the university "pause"/students moving/etc, the due dates for Lessons 2-4 Mastering Assignments/GRQs and Quiz 1 have been extended to Friday, August 28th at 11:55PM.</p>	<ul style="list-style-type: none"> • Interpret experiments about protein production and make conclusions about why protein production is impaired in cystic fibrosis. • Categorize molecules that cross membranes freely and those that do not and the consequence of synthetic molecules crossing cell membranes freely. • Discriminate between passive transport, active transport, and bulk transport of molecules across a membrane.
<p>Thurs. Aug. 27</p>	<p>LIVE Review Session with Dr. Garland Time 1:15-2PM</p>	
<p>Tues. Sept. 1</p>	<p>Reflections on Learning Survey (on Gradescope)</p> <p><u>Lesson 5</u></p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> • Cell Signaling Via Hormones 	<ul style="list-style-type: none"> • Predict how water will move via osmosis and explain why this is critical to your cells. • Describe how the two types of chemical signaling mechanisms affecting target cells differently. • Apply the two mechanisms of chemical signaling to insulin signaling and sex hormone signaling.

Thur. Sept. 3	<p>Lesson 6</p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> Energy and Enzymes and Cellular Respiration 	<ul style="list-style-type: none"> Explain the importance of enzymes in metabolism and how they are inhibited. Explain how ATP does work. List the inputs and outputs of aerobic cellular respiration and describe the big picture for why cells use this process. Explain how coenzymes are reduced during respiration and how this contributes to ATP formation. Describe big picture of cellular respiration and how it relates to breathing.
Thurs. Sept. 3	LIVE Review Session with Dr. Garland Time 1:15-2PM	
Tues. Sept. 8	<p>Exam 1 Check-In Activity (on Gradescope)</p> <p>Lesson 7</p> <p>Mastering and GRQs:</p> <ul style="list-style-type: none"> Cellular Respiration 	<ul style="list-style-type: none"> Diagram the major stages of aerobic respiration, noting the location in the cell and the inputs and outputs of each stage. Explain how a H⁺ gradient and oxygen are both necessary for oxidative phosphorylation. Describe anaerobic respiration pathways and differentiate them from aerobic pathways.
Thur. Sept. 10	<p>Quiz 2 (on Mastering; timed; only one try per question on quizzes; do quiz 2 before lesson 8)</p> <p>Lesson 8</p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> Photosynthesis <p>Practice Exam 1 on Gradescope:</p> <ul style="list-style-type: none"> **Due Monday Sept. 14 at 11:55pm Cumulative Unit 1 exam prep with questions very similar to those on exam. 	<ul style="list-style-type: none"> Describe where the mass of a tree comes from and explain how the "mass" is made. Explain how trees are carbon sinks. Describe the two parts of photosynthesis and the inputs and outputs of both parts. Explain what kind of sunlight is used by the plant and why sunlight is necessary. Explain photophosphorylation in the light reactions of photosynthesis, and describe how photophosphorylation is similar and different from the oxidative phosphorylation in aerobic respiration.
Thurs. Sept. 10	LIVE Review Session with Dr. Garland Time 1:15-2PM	
Tues. Sept. 15	<p>EXAM 1</p> <ul style="list-style-type: none"> Covers all material in Unit 1 	<ul style="list-style-type: none"> Study powerpoints, GRQs, quizzes, class notes and all your LC questions! Also, check out the dynamic study modules and "Study Area" on Mastering for more Qs.

UNIT 2: GENETICS & MOLECULAR BIOLOGY

Learning Objectives:

- How do cells store, transmit and use genetic information to make proteins?
- What are the consequences for organisms when these processes go awry?

Date	Lesson Assignment	Lesson Objectives
	<p>Due 11:55 PM on the night before class unless otherwise noted**</p> <p>Do GRQs first (readings listed in GRQ) and then do Mastering. (All GRQs turned in via Gradescope)</p>	
Thur. Sept. 17	<p>Lesson 9</p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> Mitosis, Development, and cancer 	<ul style="list-style-type: none"> Contrast asexual and sexual reproduction in outcome and types of organisms/cells that use Recognize/draw the stages of mitosis, contrasting animal and plant cells and explain the cell specific stages of mitosis failing. Describe how cell division plays a role in development. Explain how cells know when it is time to divide/not divide. Explain how cancer cells disobey the rules that normal cells follow in the cell cycle and in c Explain the significance of a mutated BRCA-1 gene in terms of risks and consequences an a gene test for actionable genes.

Thurs. Sept. 17	LIVE Review Session with Dr. Garland Time 1:15-2PM	
Tues. Sept. 22	Lesson 10 GRQs and Mastering: <ul style="list-style-type: none"> Meiosis 	<ul style="list-style-type: none"> Define haploid, diploid, and homologous chromosomes and be able to calculate the diploid number when given an illustration of a cell. Draw how variation arises during meiosis from independent orientation at metaphase I.
Thur. Sept. 24	Quiz 3 (on Mastering; timed; only one try per question on quizzes, do quiz 3 before lesson 12) Lesson 11 & 12 GRQs and Mastering: <ul style="list-style-type: none"> Patterns in Inheritance I Patterns in Inheritance II 	<ul style="list-style-type: none"> Construct Punnett squares. Determine mode of inheritance of a pedigree (autosomal dominant or recessive or X-linked) Calculate probabilities when given pedigrees. Design genetic crosses that determine if a trait is dominant or to determine an individual's genotype Recognize and/or solve problems that are non-Mendelian variations of inheritance (incomplete dominance, co-dominance, multiple alleles, pleiotrophy, and polygenic traits)
Thur. Sept. 24	LIVE Review Session with Dr. Garland Time 1:15-2PM	
Tues. Sept. 29	Exam 1: Reflection, Self-assessment, and Exam Item Analysis (on Gradescope) Lesson 13 GRQs and Mastering: <ul style="list-style-type: none"> Flow of Genetic Information I 	<ul style="list-style-type: none"> Draw a basic model of DNA, being able to point out where DNA variation is part of the structure Distinguish what makes somatic cells in the body similar and what makes them different. Trace a specific DNA sequence all the way to a protein. Calculate the variations in code that lead to the same protein. Calculate variation in proteins of same size.
Thur. Oct. 1	Quiz 4 (on Mastering; timed; only one try per question on quizzes, do quiz 4 before lesson 15) Lesson 14 GRQs and Mastering: <ul style="list-style-type: none"> Flow of Genetic Information II 	<ul style="list-style-type: none"> Transcribe and translate two different alleles of a gene. Define an allele. Describe different types of mutations. Use genetic and molecular data to determine an individual's phenotype.
Thurs. Oct. 1	LIVE Review Session with Dr. Garland Time 1:15-2PM Practice Exam 2 on Gradescope; <ul style="list-style-type: none"> **Due Mon. Oct. 5 at 11:55pm Cumulative Unit 2 exam prep with questions very similar to those on exam. 	
Tues. Oct. 6	Exam 2 <ul style="list-style-type: none"> Covers all material in Unit 2 	<ul style="list-style-type: none"> Study powerpoints, GRQs, class notes and all your LC questions Also, check out the dynamic study modules on Mastering and the "Study Area" in Mastering

UNIT 3: ANATOMY & PHYSIOLOGY

Learning Objectives:

- How do the emergent properties of immunity, reproduction, and digestion arise from interacting components of these systems?

Date	Lesson Assignment	Lesson Objectives
	Due 11:55 PM on the night before class unless otherwise noted** Do GRQs first (readings listed in GRQ) and then do Mastering. (All GRQs turned in via Gradescope)	
Thur. Oct. 8	Lesson 15 GRQs and Mastering:	<ul style="list-style-type: none"> Describe the basic components of the immune system. Compare and contrast humoral and cell-mediated immunity. Explain how vaccines work with the adaptive immune system

	<ul style="list-style-type: none"> Immunity 	
Thurs. Oct. 8	LIVE Review Session with Dr. Garland Time 1:15-2PM	
Tues Oct. 13	<u>Lesson 16</u> GRQs and Mastering: <ul style="list-style-type: none"> Reproduction part I 	<ul style="list-style-type: none"> Describe the structure and function of male and female anatomy. Discuss prevention and consequences of various STDs.
Thur. Oct. 15	<u>Lesson 17</u> GRQs and Mastering <ul style="list-style-type: none"> Reproduction part II 	<ul style="list-style-type: none"> Illustrate how the hormones and anatomy of the reproductive age female change over a month-- with and without pregnancy. Explain how the pill prevents pregnancy.
Thurs. Oct. 15	LIVE Review Session with Dr. Garland Time 1:15-2PM	

UNIT 4: BIODIVERSITY

Learning Objectives:

- Why and how is biodiversity maintained through ecological interactions?
- How does biodiversity arise through evolution?
- How do we identify and measure evolutionary processes?
- What mechanisms drive evolution?

Date	Lesson Assignment	Lesson Objectives
	<p>Due 11:55 PM on the evening before class unless otherwise noted**</p> <p>Do GRQs first (readings listed in GRQ) and then do Mastering. (All GRQs turned in via GradeScope as PDF, JPEG or Word document).</p>	
Tues. Oct 20	<p>Quiz 5 (on Mastering; timed; only one try per question on quizzes, do quiz 5 before lesson 10)</p> <p><u>Lesson 18</u> GRQs and Mastering: <ul style="list-style-type: none"> Phenology and Species </p>	<ul style="list-style-type: none"> Determine if two organisms are from the same species; be able to explain the benefits and draw-backs of different definitions of a species Explain the uses for the biological species concept of species and its limitations. Explain the factors that determine the timing of life cycle events for a species
Thur. Oct. 22	<p><u>Lesson 19</u> GRQs and Mastering: <ul style="list-style-type: none"> Populations </p>	<ul style="list-style-type: none"> Explain how scientists estimate population size Use the exponential growth model to calculate population growth. Compare and contrast logistic and exponential models of growth. Explain the difference between density dependent and independent population change
Thurs. Oct. 22	LIVE Review Session with Dr. Garland Time 1:15-2PM	
Tues. Oct. 27	<p><u>Lesson 20</u> GRQs and Mastering: <ul style="list-style-type: none"> Community Interactions </p>	<ul style="list-style-type: none"> Distinguish levels of hierarchy in ecology and which levels include abiotic interactions with organisms. Explain the consequence of two species have the identical niche. Describe and give examples of five types of community interactions.
Thur. Oct. 29	<p>Quiz 6 (on Mastering; timed; only one try per question on quizzes; do quiz 6 before lesson 22)</p> <p><u>Lesson 21</u> GRQs and Mastering:</p>	<ul style="list-style-type: none"> Compare/contrast germ free and conventionally raised mice. Explain why the community of microbes that live in our intestines can be considered a second "digestive system" for the human host. Provide evidence that a change in diet affects the microbial community within the mammalian gut. Provide evidence that the composition of gut microbes can cause obesity and reflect on the impact of this idea in human health and physiology.

	<ul style="list-style-type: none"> The microbiome 	
Thurs. Oct. 29	LIVE Review Session with Dr. Garland Time 1:15-2PM	
Tues. Nov. 3	<p><u>Lesson 22</u></p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> How Populations Evolve I <p><u>Practice Exam 3 on Gradescope</u></p> <ul style="list-style-type: none"> **Due Sun. Nov. 4 at 11:55 pm Cumulative exam prep with example questions similar to those on exam. 	<ul style="list-style-type: none"> Distinguish components of the theory of natural selection that are true vs. common misconceptions. Distinguish creationist and naturalistic views and what polls about evolution tell us about Americans and countries worldwide. Explain what science is and why the study of evolution is a science. Explain Darwin's ideas about natural selection and how his ideas were better understood once combined with Mendel's work. Define how microevolution is measured.
Thur. Nov. 5	<p><u>Exam 3</u></p> <ul style="list-style-type: none"> Covers all of Unit 3 and Part of Unit 4 (up to microbiome) 	<ul style="list-style-type: none"> Study powerpoints, GRQs, class notes and all your LC questions Also, check out the dynamic study modules on Mastering and the "Study Area" in Mastering for more Qs.
Tues. Nov. 10	<p><u>Lesson 23</u></p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> How Populations Evolve II 	<ul style="list-style-type: none"> Explain the conditions that must be met for non-evolution. Perform Hardy Weinberg calculations and determine if a population is in HW equilibrium or not. Explain how genetic drift, mutation, gene flow and natural selection affect allele frequency in a population. Recognize what form of microevolutionary force is a driving force in examples of evolution.
Thur. Nov. 12	<p><u>Quiz 7</u> (on Mastering; timed; only one try per question on quizzes, due before lesson 25)</p> <p><u>Lesson 24</u></p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> Origin of Species 	<ul style="list-style-type: none"> Define the conditions that lead to speciation. Distinguish various reproductive barriers that keep species separate. Construct a phylogenetic tree when given morphological data and a list of organisms.
Thurs. Nov. 12.	LIVE Review Session with Dr. Garland Time 1:15-2PM	
Tues. Nov. 17	<p><u>Lesson 25</u></p> <p>GRQs, but no Mastering:</p> <ul style="list-style-type: none"> Global Change <p><u>Practice Final Exam on Gradescope;</u></p> <ul style="list-style-type: none"> **Due Tues. Nov 17 at 11:55pm Cumulative exam prep with example questions very similar to those on exam. 	<ul style="list-style-type: none"> Wrap up course
Noon on November 18th	<p><u>Final Exam</u></p> <ul style="list-style-type: none"> Cumulative (~70 Multiple Choice questions and 1 page of short answer) 	<ul style="list-style-type: none"> Review objectives from each class Review powerpoints Review lecture videos Review quizzes and exams and Mastering Be active in your studying by quizzing yourself Retake Practice Exams 1, 2, & 3 as well as the Practice Final Exam