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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 class, keeping up with asynchronous class materials in the schedule provided and participating through provided technology. Students are also expected to rout quizzes and exams. **We recommend using the Lessons feature on Sakai to keep yourself organized day-to-day.**

This is a highly-structured course because we have evidence that every student can achieve if they are motivated to be an active 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 unf circumstances occur. These changes will be announced as early as possible so that students can adjust their schedules.

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 assign* Students are responsible for all material covered in the assigned readings and other multi-media sources, videos, and online assignments that are assigned for each lesson. Dr. E synchronous personal office hours on Mondays and a group office hour (or review session!) on Fridays. Use the Sakai Sign Up tool for these events. While these synchronous se required, students are strongly encouraged to attend. Additional office hours / review sessions will be added throughout the semester. **Use the Sakai Calendar to keep track of and use the Sakai Sign up tool to join an event.**

About the Professor and Office Hours

Class Time: Monday and Wednesday 5:20-6:35pm

Review with Dr. Evans: Fridays (time TBD) – Live but recorded. Attendance is optional.

Location: Classes are asynchronous (recorded) and will be available by 12noon the day of class. **Recommended: complete your class activities for the 6:35pm on Mon and Weds.**

About the Professor and Office Hours

Professor: Dr. Mara Evans

Email: mara1@email.unc.edu

Office Hours: Mondays, 5:20-6:35pm and Fridays as group review sessions or by appointment (send email with BIOL 101 in the subject line!).

For personal matters please see "Sakai Sign-up" for weekly available times. These will be 15minute private sessions.

Office Hours: There are two kinds of office hours this semester –

Group Review Sessions on Fridays. Time TBD. No need to sign up. Just attend with the zoom link. Be sure to post your review question requests to Piazza before Friday.

Private office hours: I really hope that you will meet with me at least once this semester. Even if you have never been to office hours before, please spend time with me (my sch open early in the semester than later). You can come alone or sign-up with a friend. You can come in to talk about the course, study skills, mental health issues, your background, advice for future courses to take, etc. I'm a Carolina First advocate, safe-zone trained (LBGTQ), and I'm an advocate for Covenant students, Chancellor Science Scholars, transfe international students, continuing education students, underrepresented minority students, first year students, sophomores, students with silent and physical disabilities, students t oxygen...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 end of the semester to ask for help.

Reserving a meeting time. Check "Sign-up" tool on Sakai menu to reserve a slot. I will post my open hours well in advance, so sign up for any day that works with your schedule with a friend. I may add hours some weeks as my schedule allows or see individuals outside of these hours if necessary; walk-ins welcome but may need to wait. If you can't make we can schedule a time. Just send me an email!

Peer Mentors and Supplemental Instruction

Peer support via Piazza: There are hundreds of students taking my classes this semester and know I cannot give you all the individual attention you deserve. I ask that you become a community of scholars to help answer questions about the course logistics and course content. [Piazza](#) is the tool that will help us do this and will help you find study buddies. I and the peer instructors, graduate Teaching Assistant will be checking in through Piazza regularly, 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.

Peer instructor support over Zoom

We have a large team of students who have completed introductory biology successfully and many of them already have experience as peer instructors. 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 welcome to attend as many peer instructions 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 n](#) 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 given for 1 per week, can't earn credit by attending all 9 sessions in the final week of class!).



What can you expect from the peer instructors:

- Use the Sakai calendar to see when sessions will be held each week. There will be at least 13 hours of review and tutoring available to you to pick from each week!
- Peer instructors will host a blend of structured review (with questions for you to practice, and going over key concepts) and answering questions that you bring to the session or Piazza before hand
- The sessions will be conducted live via Zoom, but not recorded.
 - Please use Sakai Sign-up to find the active links being used.

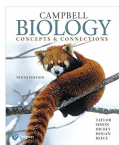
Why should you attend these sessions on a regular basis. We have data that suggests students that attend score on average half a grade better than peers who don't attend. fit one into your schedule early in the semester and attend weekly as if it is a required class.

Bio Cell with Biology Specialist: Feel you need a more basic review and more in-depth help? Sessions will be offered weekly with Robin Blanton, a highly experienced Academ Coach. Attend these free, weekly sessions sponsored by the Learning Center. Learn more and sign up for the weekly sessions [here](#).

Required Resources

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

The UNC bookstore will email you with details about what to purchase so you have access on the first day (this includes a 14-day grace period without payment). Ultimately you n Mastering Biology (online), Learning Catalytics (online) and some form of the book (either ebook or physical, or both). We have worked closely with Pearson and Boostore to provide you with the most cost-effective options. Note: there are hard-copy books on reserve at the Undergraduate Library.



COURSE CODE for Spring 2020: evans74944

Required reading: Particular chapters are required (see Guided Reading Questions—GRQs— for specific details). You should read and answer the GRQs *before* Mastering Biology homework assignments.

How to attend class every day

1. Log in to Sakai and click on the "Lesson" tab for the day.
2. **Before class -- Completed Guided Reading Questions (GRQs)** that you finished before class and can use as a reference. Find these posted on Sakai. **You may only submit your GRQs as a PDF or a Word document to [Gradescope](#). Assignments submitted as Pages (Apple product) will not receive credit.**
3. **During scheduled class time – you will need to**
 - **Have a computer or tablet**
 - **Log in to Sakai and Learning Catalytics – open the day's session**
 - **Make sure to 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 a tablet 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.
 - **Extra blank paper for drawings, notes, activities etc.** (or tablet computer for drawing).

**Course Components Making Up Final Grade**

Give anonymous feedback at any time! Your thoughts on how the course is going is important to me. Feel free to submit your anonymous thoughts at any time during there semester you read all of the submissions myself: <https://forms.gle/gqRJ8m5wzCC7HEeM9>.

Homework via Mastering Biology (9% of your grade): Homeworks will be due generally every Sunday and Tuesday night by 11:55 PM (see detailed schedule). Some assignm 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 fashic finish it by 11:55 PM. ****I recommend submitting your work at least 20-30 minutes before the due time to account for internet and loading issues**.** **Late homework will receive ze** 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 post at 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 ans 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 day 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.
- Access Mastering at: www.pearsonmylabandmastering.com (Instructions for registering are delivered via email from the UNC Bookstore. Course code is in this email and the " Sakai, too.)

Participation (7% of your grade): Most of this grade will come from Learning Catalytics (LC) (4%), but attending peer instruction (9 sessions over the whole semester), completic exams, surveys, Guided Reading Questions (GRQs) submitted to Gradescope and small group work (3%). To participate, we will use Learning Catalytics (accessed through Mast

while you watch the lesson videos. Note: these questions ought to be done while you're watching the lesson videos and are graded only for effort BUT they are often practice exam a good way to gauge your understanding of the material.

How is LC graded? The self-paced LC session for any lesson will be open for 48 hours (noon M to noon Weds and noon Weds to noon Friday). Questions will be participation-based for correctness. A few points will be dropped for all students to accommodate occasional absence, tech problems, personal emergency, lateness, etc. Please do not email me to find out if you missed or forgot about an LC session; we will have so many opportunities for participation that missing one or two sessions in the semester will not affect your grade (I will end up giving 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 informal 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 Sakai by 11:55PM on Sunday and Tuesday evenings. ***I recommend submitting GRQs 20-30 minutes before the deadline to allow for loading and internet issues***. You must submit the GRQs as either a PDF or a 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 carefully labeling the matching GRQ lesson number. If you accidentally submit the wrong GRQ file to the wrong assignment you have until the due date/time to make a correction and resubmit for credit.

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. Your lowest **midterm** exam score will be dropped, your final exam grade will count towards your final grade no matter the score. Only the final exam is cumulative, although objectives around scientific thinking skills will be tested on each exam. Each semester exam will cover the material specified on the course schedule. All exams will be administered on Gradescope. **Exams will be open from 5pm to 7pm EST on the day of the exam, but you will have 75 minutes to complete the exam once you open it.**

***Students who use ARS: Once I have been sent your necessary accommodation info your exam time will be extended accordingly.*

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 from the exams given in class and must be completed within an academic week of the 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.

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 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 to 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 yourself.

A Few Other Notes

Digital Etiquette: This class will be taught entirely online which means that there are ample opportunities to get distracted. This section of the syllabus serves to offer some suggestions on how to be **intentional and thoughtful** about your use of digital devices.

Research suggests that the human brain is **not** as excellent at multitasking as we think it is. Please be respectful of your own learning and focus and hold yourself accountable: when you are in "class" make sure that your use of digital devices is for course content only. I understand that your devices connect you to your friends and family (a wonderful thing!) but while "in class" encourage you to set time aside, however briefly (even if it seems like an eternity to you), from the outside world and distractions. You will learn more if you concentrate on the course content.

are here. **Remember:** in a self-paced class you have lots of freedom to plan your own schedule and take breaks frequently. Paying attention to how you use your time, how quickly and how you feel during and after that task is all important information. Take care of yourself while you learn and keep a steady pace through the semester.

Should you take notes by hand or type? Research suggests taking notes by hand (paper or tablet) is the best way to learn in a highly structured course like this! No matter how handwriting or notetaking is -- TAKE NOTES BY HAND! You will have class outlines that you should write and draw on. Yes, at times it feels a little silly -- but that's what keeps it fun watching you or judging you, so please do your best to follow instructions in class. It will pay off in the end. Much of biology is about drawing, so typing just won't be useful. Power posted when the videos become available and will be useful for review purposes.

Sakai Site: This site is our main class website. It will have postings from lectures such as outlines, power point slides, and supplemental material I mention in lecture. I will also 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 be forming two kinds of groups in BIOL 101.

TEAM

You will be part of a **TEAM** (around 30 people) 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. Get to know another and your peer instructor. Your TEAM assignment will happen before August 14. You'll be notified via Sakai. You are welcome to attend any peer instruction session during the semester. We hope that you will find solace with your team, too.

SMALL GROUP

Later in August, after you've gotten to know your teammates, I will assign you to a **SMALL GROUP** within your team. This will be a group of 5. The idea is that your small group will be your buddies, your sounding board, your seat-mates.

The goal with both of these efforts is to encourage community building within a large course. In a classroom it's easy to turn to your neighbor and have a conversation. It's easier to do that part of a class because people are all around you! In an online class you might feel isolated at times and I want to make sure you have resources to *not* feel lonely, and know who to turn to for help when you need it.

**In some instances, working face to face with other people is very difficult for some learners. Please send me an email if you have enormous anxiety about group work so we can discuss accommodations and strategies.*

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 experienced 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 "terminate" that member.

Terminating involves a two-step process: First, the team (in consultation with Dr. Evans) gives the wayward member a warning that includes the wayward teammate negotiating with the team about how he or she is going to be a better teammate. Second, if the member continues to behave inappropriately, they will be terminated from the group. Bad team member tendencies early, so let a problematic group member know his or her behavior is not acceptable early.

Course Goals

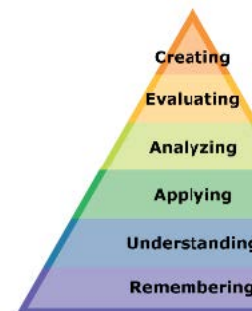
1. This course should prepare you to succeed in future science courses. You should learn how to be an active learner in the lecture hall and you should learn how to do educational research. Educational research has shown that students in this course who do reading/ homeworks before class, actively participate in class, and review notes regularly can and will succeed. If you are underprepared because of your background? The course is designed to equalize your readiness before class—while you may take several hours reading and preparing, another student 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 enter college very skilled at remembering and understanding (Regurgitating memorized information.) True learning will take place when you are challenged to apply, analyze, evaluate, and synthesize. I will challenge you to do this. You might find this difficult and uncomfortable, but you will be learning!

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, in-class activities, 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 will be 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 more 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 more every day. I'll continually encourage you to read about biological issues and advances in the popular media. Share what you learn with me by posting in the Piazza "News" folder. Regardless of your future plans, my goal is for you to become excited about biology and empower yourself to learn more -- this will not only help you become a more better informed individual, but will make me a happy professor!

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 what they are unsure about. They **do NOT** spend time making their own extensive outlines (or copying out of the book), 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 tool to learn.
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 session 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 checking with a 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 Homework assignments, GRQs, Quizzes, Learning catalytics, class, etc. to see if they could TEACH it to someone else. Successful students don't just simply get the right answer and move on, they are able to explain how someone arrives at this answer.
9. attend peer instruction sessions, tutoring hours, or study groups routinely because once they have done the work alone, they can collaborate and learn even more from others (using Piazza and class time to meet peers.)
10. have a system for planning and keeping track of all deadlines (using a physical planner, a notebook, or a digital calendar with reminders to their phone).
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 and links for office hours, peer instruction etc. will be posted to Sakai. Changes will be sent out through announcements. All materials you need (GRQs, outlines, powerpoints, old exams) are found in the through the Lessons tab in Sakai (and also the resources folder of Sakai)

I Want to Help You: Reach me through office hours or by email. I am a really nice person...nobody to be scared of!! Come see me after the first exam if you did not do well. It is my goal to offer suggestions if you wait to talk to me until the end of the semester after you've done poorly on all three exams.

How to prepare for an exam? Use GRQs, class outlines, Learning Catalytics questions, Power Point slides. Be able to explain, draw, compare etc. (See following page with idea of how you demonstrate you know something.) **READING (the textbook or your notes) is NOT studying.** Studying involves blank paper, explanations, drawings, etc. Don't forget the 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 define diversity to include gender identity, national origin, ethnicity, religion, social class, age, sexual orientation, political background, and physical and learning ability. We strive to make this classroom and department an inclusive space for all students.

Approach to Class Meetings

- Make sure to use the Lesson tab in Sakai to keep organized!

Before Class:

- **Read** the assigned pages and **complete all** Guided Reading Questions (complete them in full sentences). Upload a word, pdf, or jpg document to Gradescope.
- Do the Modified Mastering Biology Assignment (ideally without looking at your notes!)

During our scheduled class time:

- Have the outline printed and be prepared to take very messy notes while you watch the lesson videos. Yes you can pause and re-watch (that's good), but your ability to focus i time. You can re-write your notes as a review strategy later. **Your notes should be messy because you will make mistakes when I ask you to pause the videos and prac ok!**
- Be prepared to answer all the questions posed to you first without looking at your notes.
- Put your answer(s) into Learning Catalytics to earn participation credit. Remember the session for each class is only open for 48hours. This is meant to help you stay on track class.
- Keep a running list of questions you have about the current topic (these are a study guide!)

After Class

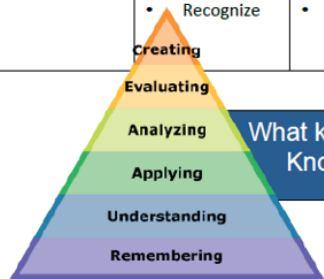
- Attend an peer instructor session, go to bio tutoring, attend BioCell, meet with a study group: do as many of these things as your schedule allows on a regular basis!
- Use the periodic quizzes to see what you know throughout the semester.
- Study a little biology every day. Start with the question "what did I learn today?" and see how much you can recall without looking at your notes. Then download the powerpoint they are available and go through them again.
- Clean up your lecture notes and identify areas of uncertainty → these are questions you can ask to your peer instructors or on the forum page!

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 assignment, 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 specific pages to read from the text, etc). The GRQs are due in Gradescope by 11:55pm 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 i 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 are subject to change (example: if technology fails us) but exam dates will not change unless the University is closed. **Late homework assignments = 0% **I recomr 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
Mon. Aug. 10	<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> <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
Wed. Aug. 12	<p>Lesson 1</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.
Fri. August 14	<p>LIVE Review Session with Dr. Evans (Time TBD)</p> <p>*Submit questions on Piazza by Th at 11:55 PM</p>	<ul style="list-style-type: none"> • Objectives set by student participants • Session will be recorded
Mon. Aug. 17	<p>Lesson 2</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.
Wed. Aug. 19	<p>Research Consent Participation Form (on Gradescope)</p> <p>Lesson 3</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).
Fri. Aug. 21	<p>LIVE Review Session with Dr. Evans (Time TBD)</p> <p>*Submit questions on Piazza by Th at 11:55 PM</p>	<ul style="list-style-type: none"> • Objectives set by student participants • Session will be recorded
Mon. Aug. 24	<p>Quiz 1 (on Mastering; timed; only one try</p>	<ul style="list-style-type: none"> • Interpret experiments about protein production and make conclusions about

	<p>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>Lesson 4</p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> • Structure and Function of Membranes 	<p>why protein production is impaired in cystic fibrosis.</p> <ul style="list-style-type: none"> • 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.
Wed. Aug. 26	<p>Reflections on Learning Survey (on Gradescope)</p> <p>Lesson 5</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.
Fri. Aug. 28	<p>LIVE Review Session with Dr. Evans Time TBD</p> <p>*submit questions on Piazza by Th at 11:55pm</p>	<ul style="list-style-type: none"> • Objectives set by student participants • Session will be recorded
Mon. Aug. 31	<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.
Wed. Sept. 2	<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.
Wed. Sept. 4	<p>LIVE Review Session with Dr. Evans (Time TBD)</p> <p>*Submit questions on Piazza by Th at 11:55 PM</p>	<ul style="list-style-type: none"> • Objectives set by student participants • Session will be recorded
Mon. Sept. 7	<p>Holiday -- No lesson due</p>	<p>None. Use this time to reflect on how your daily study routine is working.</p>
Wed. Sept. 9	<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 	<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.
Fri. Sept. 11	<p>LIVE review session with Dr. Evans (Time TBD)</p> <p>*Submit questions on Piazza at 11:55 PM</p> <p>Practice Exam 1 on Gradescope</p>	<ul style="list-style-type: none"> • Objectives set by student participants • Session will be recorded

	<ul style="list-style-type: none"> • **Due Sunday Sept. 13 at 11:55pm • Cumulative Unit 1 exam prep with questions very similar to those on exam. 	
Mon. Sep. 14	<p><u>EXAM 1</u></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>	
Wed. Sept. 16	<p><u>Lesson 9</u></p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> • Mitosis, Development, and cancer <p>Don't forget to print your new outlines</p>	<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 cycle of 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.
Fri. Sept. 18	<p>LIVE Review Session with Dr. Evans (time TBD)</p> <p>*Submit questions on Piazza by Th at 11:55 PM</p>	<ul style="list-style-type: none"> • Objectives set by student participants • Session will be recorded
Mon. Sept. 21	<p><u>Lesson 10</u></p> <p>GRQs and Mastering:</p> <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.
Wed. Sept. 23	<p>Quiz 3 (on Mastering; timed; only one try per question on quizzes, do quiz 3 before lesson 12)</p> <p><u>Lesson 11</u></p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> • Patterns in Inheritance I 	<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.
Fri. Sept. 25	<p>LIVE review session with Dr. Evans (time TBD)</p> <p>*Submit questions on Piazza by Th at 11:55 PM</p>	<ul style="list-style-type: none"> • Objectives set by student participants • Session will be recorded
Mon. Sept. 28	<p><u>Lesson 12</u></p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> • Patterns in Inheritance II 	<ul style="list-style-type: none"> • Design genetic crosses that determine if a trait is dominant or to determine an individual's g • Recognize and/or solve problems that are non-Mendelian variations of inheritance (incomp dominance, co-dominance, multiple alleles, pleiotrophy, and polygenic traits)
Wed. Sept. 30	<p>Exam 1: Reflection, Self-assessment, and Exam Item Analysis (on Sakai in Tests & Quizzes)</p> <p><u>Lesson 13</u></p> <p>GRQs and Mastering:</p>	<ul style="list-style-type: none"> • Draw a basic model of DNA, being able to point out where DNA variation is part of the stru • 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.

	<ul style="list-style-type: none"> Flow of Genetic Information I 	
Fri. Oct. 2	<p>LIVE Review Session with Dr. Evans (time TBD)</p> <p>*submit questions on Piazza by Th at 11:55 PM</p>	<ul style="list-style-type: none"> Objectives set by student participants Session will be recorded
Mon. Oct. 5	<p>Quiz 4 (on Mastering; timed; only one try per question on quizzes, do quiz 4 before lesson 15)</p> <p>Lesson 14</p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> Flow of Genetic Information II <p>Practice Exam 2 on Sakai</p> <ul style="list-style-type: none"> **Due Tues. Oct. 6 at 11:55pm Cumulative Unit 2 exam prep with questions very similar to those on exam. 	<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.
Wed. Oct. 7	<p>Exam 2</p> <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 Masterin
Fri. Oct. 9	<p>LIVE Review session with Dr. Evans (Time TBD)</p> <p>*submit questions on Piazza by Th at 11:55 PM</p>	<ul style="list-style-type: none"> Objectives set by student participants Session will be recorded

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
	<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>	
Mon Oct. 12	<p>Lesson 15</p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> Immunity 	<ul style="list-style-type: none"> Describe the basic components of the immune system. Compare and contrast humoral and cell-mediated immunity. Explain how vaccine's work with the adaptive immune system
Wed Oct. 14	<p>Lesson 16</p> <p>GRQs and Mastering:</p> <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.
Fri. Oct. 16	<p>LIVE Review Session with Dr. Evans (Time TBD)</p> <p>*Submit questions on Piazza by Th at 11:55 PM</p>	<ul style="list-style-type: none"> Objectives set by student participants Session will be recorded
Mon Oct. 19	<p>Lesson 17</p> <p>GRQs and Mastering</p> <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.

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
Wed Oct 21	<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> <p>Quiz 5 (on Mastering; timed; only one try per question on quizzes, do quiz 5 before lesson 10)</p> <p>Lesson 18</p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> • Phenology and Species 	<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
Fri. Oct. 23	<p>LIVE Review Session with Dr. Evans (Time TBD).</p> <p>*Submit questions on Piazza by Th at 11:55 PM</p>	<ul style="list-style-type: none"> • Objectives set by student participants • Session will be recorded
Mon Oct. 26	<p>Lesson 19</p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> • Populations 	<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
Wed. Oct. 28	<p>Lesson 20</p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> • Community Interactions 	<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.
Fri. Oct. 30	<p>LIVE Review session with Dr. Evans (Time TBD)</p> <p>*Submit questions on Piazza by Th at 11:55 PM</p>	<ul style="list-style-type: none"> • Objectives set by student participants • Session will be recorded
Mon Nov. 2	<p>Quiz 6 (on Mastering; timed; only one try per question on quizzes; do quiz 6 before lesson 22)</p> <p>Lesson 21</p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> • The microbiome 	<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.
Wed. Nov. 4	<p>Lesson 22</p> <p>GRQs and Mastering:</p> <ul style="list-style-type: none"> • How Populations Evolve I 	<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.

		<ul style="list-style-type: none"> • 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.
Fri. Nov. 6.	<p>LIVE Review Session with Dr. Evans (time TBD)</p> <p>*submit questions on Piazza by Th at 11:55 PM</p> <p><u>Practice Exam 3 on Gradescope</u></p> <ul style="list-style-type: none"> • **Due Sun. Nov. 8 at 11:55 pm • Cumulative exam prep with example questions similar to those on exam. 	<ul style="list-style-type: none"> • Objectives set by student participants • Session will be recorded
Mon. Nov. 9	<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.
Wed. Nov. 11	<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.
Fri. Nov. 13.	<p>LIVE Review session with Dr. Evans (time TBD)</p> <p>*Submit questions on Piazza by Th at 11:55 PM</p>	<ul style="list-style-type: none"> • Objectives set by student participants • Session will be recorded
Mon. Nov. 16	<p>Quiz 7 (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 <p><u>Practice Final Exam on Gradescope</u></p> <ul style="list-style-type: none"> • **Due Wed. Nov 18 at 11:55pm • Cumulative exam prep with example questions very similar to those on exam. 	<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.
TBD	<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