

**BIOL 101.002: Principles of Biology**  
**Fall 2019 – Syllabus and Course Schedule**

**Class Information**

**Time:** MW 3:35-4:50pm  
**Location:** Genome Science Bldg. 100

**Instructor Information**

Dr. Mara Evans  
mara1@email.unc.edu  
Office Location: 104A Wilson Hall

**Office Hours:** Tues 11-12, 2-4pm; Th.2-4pm  
Sign up use website: [maraevans.youcanbook.me](http://maraevans.youcanbook.me)  
**Additional group hours will also be announced periodically via Sakai**

**Peer Instructors – Check Piazza and Sakai for Peer Instruction Hours!**

**→Sign up for BIOL 101 at Course.Care (use Course ID: 239DC9) to keep track of when sessions will be offered**

**Peer Instructors**

Lucas DePasquale  
Mahdi Elabdellaoui  
Claire Dixon  
Samuel White  
Georgia Roper  
Renee Li  
Vaishnavi Siripurapu  
Darien Campisi  
Megan Hastings  
Amber Long  
Amelia Nichole Curtis  
Chloe Silva  
Chris Zammit

**\*\*NOTE:** Peer Instruction will begin the week of August 26. Information about rooms and times will be posted and you can check the website **Course.Care**

**Assignment/Lecture Schedule is posted at the end of this document. Read on for more course information!**

**Welcome to BIOL 101: Principles of Biology!** This course 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 great deal of practice with biology and that any prior experience is likely to be several years ago.

As a BIOL 101 student you are expected to take a very active role in your learning by completing readings and homework before and after class, and coming to class ready to participate directly with peers and through in-class technology. In this highly structured course, ***we have evidence that every student can achieve if they are motivated to actively learn!*** A majority of students spend about 4-7 hours per week **outside of class** working on this course. We will use our class time to discuss material and solve problems based on your reading and studies outside of class. The format of the class will vary from day to day, but in general you can expect in-class activities, discussion, and problem solving.

Both individually, and as a class, we will strive to:

- *Evaluate a scientific study and determine if its design is sound.*
- *Describe the properties of life.*
- *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 genetic information: how genes relate to proteins and how genetic information is copied and inherited.*
- *Explain how life on earth evolved and how adaptations relate to survival, reproduction, and intra- and inter-specific interactions.*
- *Explain detailed examples of adaptations in the animal body in which “structure fits function” at the cellular and whole body level.*

This document will serve as our syllabus, or “roadmap,” for the semester; the "Lesson Schedule" portion of this document contains a calendar of activities and assignments. Any content of this syllabus and/or schedule is subject to change as we go through the course. Changes will be announced in class and electronically (via announcements on Sakai).

#### **Class Resources:**

- **Required text and Required Online Mastering Biology Access:**  
Campbell Biology, Concepts and Connections, 9th Edition by Taylor, et al. 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 need access to Mastering Biology (online), Learning Catalytics (online) and some form of the text (either ebook or physical, or both!).** We have worked closely with Pearson and the UNC Bookstore to provide you with the most cost effective options. Note: there are several hard-copy books on reserve at the Undergraduate Library.
- **Sakai Site** (you will need your ONYEN to log on): We will rely heavily on the class website. This site will have postings from our class lessons such as outlines, power point slides, old exams, and supplemental material mentioned in lecture. Announcements and/or emails will be sent regarding student concerns on this site. *It is your responsibility to check it and your UNC email account regularly.*
- **Posted Resources.** Important class resources will be posted to the course Sakai website. This includes lecture slides, additional reading, handouts, and study guides. You are responsible for

keeping up with the material posted to the website. Any changes to documents and resources will be posted with a Sakai announcement before class.

- **Supplemental Instruction (SI):** Your SI sessions will be offered multiple times a week. Each session will be scheduled for 1 hour. The times and location of these sessions will be posted on Course.Care (←that's the website!) and Sakai in the second week of class. You are not required to attend SI, but it is highly recommended, since this is your opportunity to get more "one-on-one" attention for this course. Plus, we have data that suggests students that attend score on average half a grade better than students who do not attend. Please fit at least one session into your schedule early in the semester and attend weekly as if it is a required class. You can contact your SIs through Piazza.
- **Peer Mentors (PMs):** Your Peer Mentors will offer small group, or one-on-one tutoring opportunities. Each PM for our course will host 1 hour session per week at a time and location posted to Course.Care (←that's the website!) and Sakai. You are not required to meet with a PM, but you will get to know them in class and they are very talented people who are trained to help you. Consider a PM session like a study hall; you can just go and sit and study without having anything else prepared. Please make it a point to visit with at least one PM sometime before the first exam. You will be pleasantly surprised!
- **Piazza:** I will teach 800 students a semester and I cannot give you all the individual attention you deserve. Instead, I ask that you become a community of scholars to help each other answer questions about the course logistics and course content. **Piazza** is a tool that will help us do this and will help you find study buddies. I and the SIs and PMs will be checking in through Piazza occasionally, but it is expected that you will answer each other's questions. I will take note of students who engage productive in this online forum

**Sign up for Piazza using this link, which is specific to our class:**

[piazza.com/unc/fall2019/biol101001fall2019](https://piazza.com/unc/fall2019/biol101001fall2019)

\*\*please make sure to sign up for BIOL 101.001 Evans and **not** BIOL 101.002 Garland

- **Office Hours:** These are hours that I set aside each week to meet with you one-on-one or in small groups (bring a friend!). You get to direct these conversations -- we can talk about whatever you want (the course, study skills, personal matters, major and career advice, internship opportunities, etc.). I have been teaching at UNC for several years now, and I still want to hear your insights into what it means to be a Tar Heel!

To reserve a time to meet during office hours, use the "sign-up" feature on Sakai. Walk-in appointments during scheduled office hours are welcome, but may need to wait if I am already with a student. *I may add hours some weeks as my schedule allows. You may also find time using this link [maraevans.youcanbook.me](https://maraevans.youcanbook.me).*

- **Email:** I will make every effort to respond to your emails quickly, but the response will not be immediate, so please plan accordingly. **When you send an email, please include [BIOL 101] in the subject line.** To comply with the Family Educational Rights and Privacy Act (FERPA), I am not allowed to respond to messages that refer to individual students or student progress in the course through non-UNC accounts, phone calls, or other types of electronic media.

- **Your classmates:** Identifying at least one study-buddy will serve you well! This classmate should be your go-to person when you have a question after class. Are you confused about an assignment requirement? What pages are you supposed to read for tomorrow? When's that assignment due? Ask \_\_\_\_\_ (fill in the name and email address of one of your classmates).

### **Basis for your course grade – Assignments and Activities**

The purpose of these activities is to keep you thinking about biology both in and out of the classroom. They are not meant to be busy work. Rather, each is meant to help you sharpen your written, oral, and reasoning skills to help your mind stay focused and engaged on the topics we discuss in class:

- **Required Reading and Guided Reading Documents:** particular chapters are required (see "Guided Reading Questions (GRQs) for specific details). You should read the assigned pages and answer the GRQs **before** you complete the Mastering Biology homework assignments. You turn in GRQs via Sakai.
- **Homework via Mastering Biology: (9% of your grade)** Homework assignments will be due every Sunday and Tuesday night by 11:55 PM, *with a few exceptions (see the Lesson Schedule below)*. Some assignments will 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 fashion, so that you finish it by 11:55 PM.** To be safe, assume your clock is 5 minutes slower than the official *Modified Mastering Biology* time. Late homeworks will receive zero credit, even though you can still do them for practice. Do not count on the Mastering Biology program to give an accurate account of how long an assignment will take. These estimates can be wildly off! There will be numerous graded at-home assignments. Assignments post about one 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. **See Sakai for how to register; visit ----**

→ [portal.mypearson.com](https://portal.mypearson.com) and use **the course ID code:** evans45218

- **Quizzes via Mastering Biology (9% of your final grade):** You will be required to do online timed quizzes in Mastering Biology (MB Quizzes). Quizzes are only posted three (3) days before they are due. This is less time than you have to work on homework assignments. Please plan accordingly! The quizzes are meant to give you practice for answering questions in a timed situation, more predictive of how you might do on an exam than a typical homework assignment. These will be administered via Mastering Biology. Missed quizzes result in zero benefit (i.e. 0 points, 0% towards your grade). *Note: You must complete the quiz once started and you cannot go backwards on these questions.*
- **Participation: 7% of your final grade.** This come from Learning Catalytics, and from attendance, Guided Reading Questions, practice exams, completion of surveys, and group work turned in via Sakai throughout the semester.
  - **What is Learning Catalytics (LC)?:** If your goal is to be a successful UNC student, and you value your education, you should plan to pay attention and actively discuss biology in class. It may come as a shock that I cannot actually require that you pay attention, or make you discuss biology once you enter the classroom. Therefore, as an incentive to be a full participant, about 7% of your grade, will come from a program called Learning Catalytics (accessed through Mastering Biology) that you use through your laptop or smartphone/tablet. The smaller the device the easier it will be for you to maneuver on your

very small in-class desk. You must have your device connected to UNC-Wifi—be sure to do this for any devices you might use in class before the first day:

<http://help.unc.edu/help/connecting-to-the-unc-network-getting-started/>

**Please do not email me to tell me you were absent for one or two days**, we will have so many opportunities for participation that missing one or two days in the semester will not affect your grade. Do not forget to review these questions/answers when studying! **Note:** The LC questions must be done in class, you may receive a zero on this portion of your final grade if you are found to be answering questions from a distant location.

- **Group activities.** Periodically during the semester, there will be opportunities during the semester when you can earn group participation points. These will be written, in class activities completed with your group members. These activities will be graded for effort, and will not be announced prior to class. **Note: if I determine that you are not physically present in class while answering poll questions or for group activities, you will automatically forfeit all participation points for the semester (7% of your grade) and your case will be reported to the UNC Honor Court (see Upholding the Honor Code below).**
- **How is LC graded?** Questions via Learning Catalytics will be for participation only. Some questions throughout the semester may be graded as correct/incorrect. Thus, it behooves you to not only come to class but to also work to get correct answers. A few points will be dropped for all students to accommodate occasional absence, tech problems, athletic travel, lateness, etc.
- **Are Guided Reading Questions graded? Yes, they are graded for effort, not correctness.** *There is no answer key for the GRQs. You will be asked to submit your answers to Guided Reading Questions on Sakai (see schedule below).* You may submit a word document or a pdf or a photo (if diagrams are required). Completing all of the available GRQs will help you earn participation points.

## GROUPS

This semester you will have an opportunity to work in a small group with 2 to 4 other students. Students learn more when they work in small groups of peers to discuss issues and solve problems. You will have an opportunity to submit a seating preference by January 25 (**e.g. you must sit in the front of the room**). An announcement will be made via Sakai with more details.

Collaborating with others is an important skill in all professions, and I am available to help you to solve interpersonal problems that may arise within your group. If you are experiencing conflict 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. Over time, 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, I reserve the right to “fire” that member. Firing involves a two-step process: **First**, the team (in consultation with me) gives the wayward member a warning that includes the wayward teammate negotiating with the entire 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. Assignments from the point of termination to the end of the semester will be completed as an individual. Bad teammates usually show their tendencies early, so let a problematic group member know his or her behavior is not acceptable early.

- **EXAMS (75% of final grade):** There will be three exams given during the regular semester and a final exam.
  - The format will be multiple choice and short answer, so bring two #2 pencils to the exam. Only the final exam is cumulative. Each semester exam will only cover the material specified on the course schedule. For all exams, you will need your PID number as identification on your exam sheet. Additionally, you may be asked to verify your identity, so it is required that you bring your one-card to each exam. Failure to produce a One-Card if asked may result in a zero on that exam.
    - **Test material to study:** GRQs, class outlines, Learning Catalytics questions (log in and review), and Power Point slides. Study guides may be provided, too. To succeed in this class, it behooves you to take each reading/homework seriously and actively engage in all class discussions. Also, see the end of this syllabus.

Your lowest midterm exam score is dropped at the end of the semester. You may **only be excused from an exam (and eligible for a make-up) if you have an excused absence**. **Information about excused absences can be found here:** <https://odos.unc.edu/student-support/class-absences>

Examples of an absence for which a make-up is eligible: documented chronic or recurring illness, pregnancy, religious holidays or high holy days, family tragedy or personal emergency, University sanctioned activities, see link for more information.

Examples of absences for which a make-up is not eligible: sudden illness (within 48 hours of an exam), personal travel (for vacation, interviews, etc.), legal matters...not sure? Ask Dr. Evans as far in advance as possible. **The purpose of the lowest dropped exam is to allow a student to miss an exam at no penalty to their grade. I encourage you to treat your preparation to every exam as if none will be dropped because the final is cumulative!**

If you find that you are going to miss an exam for a University sanctioned excused absence please let me, Dr. Evans, 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 original exam date.

**Again, IMPORTANT →If you believe you will miss an exam for a University sanctioned excused absence or if you have questions please let me (Dr. Evans) know as soon as possible.**

#### **How is a course grade determined?**

*(Note: there will be no changes to **how** your final average is calculated at the end of the semester, so please don't ask!)*

#### ***This is how your final grade is calculated:***

**The lowest midterm examination grade is dropped** and the total for the semester =  
 $(0.25 \times \text{exam}) + (0.25 \times \text{exam}) + (0.25 \times \text{final exam}) + (0.10 \text{ MB homework average}^*) + (0.07 \text{ participation score}) + (0.08 \text{ MB quiz score}^*)$

*\*Mastering Biology gives us one combined weighted average at the end of the semester for the homework and quizzes conducted through their site.*

**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 is less than: 59.9% (or a score of 45% or less on the final exam)	

**What should you bring to class every day?**

1. **Lesson Outlines from Sakai** (either printed or on laptop). *I strongly recommend hand writing your notes; educational research shows that students learn more by handwriting notes, despite the perceived convenience of a laptop or tablet*
2. **Extra blank paper for drawings, notes, activities etc.** (or tablet computer for drawing)
3. **A smart-device:** either your laptop/ipad/smartphone enabled for UNC wi-fi access (*do not rely on cellular service*)

**BEFORE CLASS**

- **Read** the assigned pages and **complete** all Guided Reading Questions (complete them in full sentences)
- Do the Modified Mastering Biology Assignment (ideally without looking at your notes!)

**DURING CLASS**

- Have the outline printed, bring a smart-device, be prepared to take very messy notes. You can re-write your notes after class. **Your notes should be messy because you will make mistakes and that's ok!**
- Be prepared to answer all the questions posed to you first without looking at your notes. Before you check your notes, as a group member or flag down a peer instructor
- Keep a running list of questions you have about the current topic (these are a study guide)

**AFTER CLASS**

- Attend an SI session, meet with a peer mentor, 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 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.
- Clean up your lecture notes and identify areas of uncertainty ← these are questions you can ask when you meet with a peer mentor or tutor!

**Student Concerns -- Frequently Asked Questions:**

**Q: Is BIOL 101 a "weed out" course?**

A: No. The average grade in this class is in the C+/B- range; this is not *bad*-- it is *average*. Some (but very few) students do earn D's and F's in BIOL 101. This is absolutely shocking to first year students who have, in the past, received A's in their high school classes by memorizing course material. Your

success in BIOL 101 will depend on how much time, energy, attention, and self-awareness you invest in the course.

**Q: Is there a pre-determined number of students that receive a C, D, or F?**

A: Nope. Read the section above to see what grade you need to *earn*. In theory, if the whole class earns A's, then the whole class is given A's.

**Q: So why do some students, who expect to do well in this class, ultimately do not do well?**

A: Three reasons:

1) students wait too long to get started with serious study habits (often the score on the first exam is a wake-up call, but please don't wait that long), this means they're not spending enough time on Biology **or** their approach is to "get through" rather than learn. Your peer instructors and instructor office hours can really help you figure out the difference between these two approaches;

2) students underestimate the effort (hours per week) required to master material and skills at a level that translates to the grades they want. **Anticipate spending 1-2hours every day studying biology.** This means that you do not wait until days before an exam to "study," rather work to know the material at hand well before any exam date rolls around. Read. Write. Ask questions.

And 3) Some students have not mastered active learning at the college level nor the study skills necessary to achieve an A or B grade (It often takes these students an exam or two for them to recognize this.) We can fix this together; please come to office hours if you feel you are under-performing academically, or take advantage of the numerous resources available to you.

**Q: Why does BIOL 101 matter?**

A: Here are several reasons for why BIOL matters...

**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 actively study.** Educational research has shown that students in this course who take the time to *honestly* complete the reading/homework *before* class, actively participate in class, and review notes regularly can and will succeed. Feeling 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 and identify what you do not know. Making mistakes is the **key** to learning. It makes more sense to make mistakes on homework and in-class when the stakes are very low, rather than on an exam.

And what if you do not 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 (repeating, or "regurgitating," memorized information.) True learning will take place when you are challenged to apply, analyze, evaluate, and synthesize. You will be challenged you to do this. You might find this difficult and uncomfortable, but you will be learning!

**2. This course should provide you with the basic language and common themes within the field of biology.** For those of you continuing in biology, this is just beginning. 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, such as how the theory of evolution helps us understand all aspects of biology. 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.).

- 4. 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 more 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 with more questions than answers! I'll continually encourage you to read about biological issues and advances in the popular media.

#### **DIGITAL ETIQUETTE -- MULTITASKING IS A MYTH!**

**\*\*I strongly urge you to take all your notes in this class by hand and leave your laptop in your bag\*\***

This course will require you to use your laptop and/or cell phone during class time. Please be respectful of your classmates and restrict your use of digital devices to course content. Despite what you may know about yourself, multi-tasking is actually a myth. Our brains cannot perform two functions simultaneously (but you are tricked into thinking it can!). So please be respectful of your own learning and realize that those around you will be distracted as you scroll through Instagram.

*If we see that you or your peers are distracted, we will ask you to put your devices away and you may forfeit your ability to earn participation points that day.* There will be times when you have completed your work or answered a poll question, but your peers have not. We ask that you assist your peers when appropriate or use the time to review your notes while you wait. I understand that your devices connect you to your friends and family, but the classroom should be a place apart, however briefly, from the outside world and distractions. You will learn more if you concentrate on the course while you are here and your classmates will thank you for not impeding their ability to learn. If you have to answer a text or a phone call, please step out of the room and return once you have completed your conversation.

#### **How to Study and Succeed in BIOL 101 -- you are expected to do the following**

- **Watch some or all of these videos:** Dr. Jeannie Loeb, a Teaching Assistant Professor in the UNC Psychology and Neuroscience department worked with the [UNC Learning Center](#) to prepare 13 AWESOME, short videos on how to be successful in college. Check them out:

<https://www.youtube.com/playlist?list=PLAJcNGZFMoDGYFvpsOPNhUafVZSCA78d3>

- **Attend class.** No, seriously: do not skip class. Sit with your group members and get to know them. And when you are in class plan to limit your electronic distractions (see digital etiquette section above). I am confident that you can do it!
- **Be disciplined:** Studying actively means avoiding distractions. If necessary, set an alarm and study for 50 minutes and take a 10 minute break. You will be spending 3 hours per week in class. I expect you to spend at least an **additional 6-7 hours outside of class per week** reviewing material, completing assignments, and reading. Use the class schedule to make a study calendar for yourself (e.g. what will you study when and for how long?).
- **Read and write every day:** Read the textbook before coming to class, and use the Guided Reading Questions to help you read deeply (as opposed to skimming). Every day after class,

without looking at your notes, answer the following questions: *What did I learn about in class today?* Try and recall as much as possible from the lesson without looking at your notes. Identify any gaps in your understanding and formulate questions. Then, look through your lecture notes. *What main points did you miss? What examples are especially important and why?* Practice making connections between the concepts covered in class (in one day and between days) and those in the textbook.

- **Practice:** Once you have completed the assigned readings and revised your notes practice **using** your knowledge to answer the Mastering Biology questions.
  - Review your notes after each class. *How long will this take? Set aside 15 minutes and make this a habit; it is guaranteed to pay off.*
  - **WARNING: “Reading over your notes” is NOT studying.** You need to quiz yourself in some way to see what you are retaining from your “reading”. Have you tried drawing the diagrams? Have you constructed flow charts or a map that links concepts? Have you tried explaining the concept aloud? Have you made paper cut-outs and tried acting out the process? Have you compared and contrasted major concepts/processes that you have learned?
  - Review your course material multiple times in multiple ways! The more times you review biology, the better it will stick. 1) read it in the book 2) discuss it in class 3) review your notes 4) review all powerpoints 5) make flashcards and 6) teach a friend
- **Get Help:** If you are having trouble please ask for help! You may want to speak to me before or after class. Email is also a good way to communicate; you may not get a reply immediately but I do read *all* my emails and I will respond as quickly as possible. Here are some additional helpful resources for you:
  - **Attend Supplemental Instruction (SI) or meet with a PM at least once a week.** One hour will not cut into your social life that much and it will reinforce the material in a way that we don’t always have time for in lecture. Your SI instructor is really creative and has all kinds of tricks and tips. Check it out every week (even if you don’t have any questions!) Our own research at UNC tells us that the average of students that go to SI perform a half a grade better than the average of students that don’t attend SI.
  - Discuss material and concerns with me (Dr. Mara Evans) during office hours, after class, or by email. *You need to come see me well in advance of an exam. Come see me after the first exam if you did not do well. It will be very difficult for me to give you helpful suggestions if you wait until you did poorly on all three exams!*
  - **Additional Free peer tutoring** is available at the Learning Center by appointment OR at Dey Hall on Tues and Wed evenings from 6-9 PM (no appointment needed). There are not usually too many people at Dey Hall and you can often get one-on-one attention. <http://www.unc.edu/depts/lcweb/>
  - **Meet with an Academic Coach at the UNC Learning Center.** If you feel you need scheduled **tutoring** and one-on-one attention with a fulltime tutor, don’t wait too long. See **Robin Blanton** at the Learning Center. She is the biology specialist and is wonderful. Schedule appointments through <http://learningcenter.unc.edu> However, her time fills up fast because she is popular! She does group sessions wonderfully too. Bring a friend!
- **Be Organized:** The best way to stay organized is to have a plan, and execute it. You will generate a lot of paper (actual or digital) in this class (lecture notes, vocabulary lists, test questions, reading questions, etc.). During the first week of class figure out a way to keep all of your documents together in one place in order to reference them quickly. I recommend a 1” 3-

ring binder. However, a simple shoebox on your bedroom floor or a computer file with color-coded notes will also work. Whatever it is, make sure the system works for you!

- **Uphold the Honor Code.** Academic honesty means that we respect each other and the work that we do; this means we behave with integrity in and out of the classroom, and do not lie, cheat or steal (e.g. using someone else's work as your own is both stealing and lying). The University of North Carolina at Chapel Hill has had a student-led honor system for over 100 years. It is our responsibility to report any instances of academic dishonesty and violations of the Honor Code. The student-led Honor System is responsible for adjudicating any suspected violations of the Honor Code. All suspected instances of academic dishonesty will be reported to the Honor System and students will receive a zero on the assignment or exam in question. Your full participation and observance of the Honor Code is expected. Please report any violations that you observe. Information, including your responsibilities as a student is outlined in the Instrument of Student Judicial Governance (here: <https://studentconduct.unc.edu/sites/studentconduct.unc.edu/files/documents/Instrument.pdf>).

And finally...Let's not forget that our lives are complicated, and college is challenging. It is possible that at some point this semester your multiple competing personal responsibilities and interests may get in the way of your academic success. It is also possible that you may get sick or have other personal emergencies. The bottom line is this: 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. While I sincerely hope that you will let me know when things are not going well, here are other campus resources you can turn to, as well:

- **Dean of Students:** If at any time during the semester you experience a personal or family illness, loss, financial stress, academic access, living issues, interpersonal violence response, alcohol or similar substance related issues, and other forces that may interfere with your well-being and success and/or academic retention please contact the Dean of Students immediately (or contact your professors and we will do so for you).  
**Website:** [deanofstudents.unc.edu](http://deanofstudents.unc.edu)
- **Academic Advising:** Your academic advisers are familiar with all of the campus policies, procedures and requirements. They are eager to answer your questions, and can help you trouble-shoot any issues you may be experiencing. Please visit with an academic adviser at least once a year!  
**Website:** [advising.unc.edu](http://advising.unc.edu)
- **Counseling and Psychological Services (CAPS):** If you are experiencing any distress please speak with a medical professional in a confidential setting. The CAPS office has daily drop in hours (here: Campus Health Services, James A. Taylor Building) or you may call them for an appointment (919-966-2281) or schedule online ([healthyheels.unc.edu](http://healthyheels.unc.edu)).  
**Website:** [campushealth.unc.edu/services/counseling-and-psychological-services](http://campushealth.unc.edu/services/counseling-and-psychological-services).
- **LGBT Center:** Provides educational services, resources and advocacy.  
**Website:** [lgbtq.unc.edu](http://lgbtq.unc.edu)
- **Carolina Women's Center:** Aims to provide an equitable working and educational environment regardless of gender. Provides assistance to all individuals regardless of gender orientation.  
**Website:** [womenscenter.unc.edu](http://womenscenter.unc.edu)

- **International Student and Scholar Services:** offers services to help international students adjust to life in North Carolina and UNC. **Website:** [iss.unc.edu](http://iss.unc.edu)

The Department of Biology values the perspectives of individuals from all backgrounds reflecting the diversity of our students. We broadly define diversity to include race, 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 this department an inclusive space for all students.

*\* 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.*

### Unit 1 Class Meeting Objectives (these are also posted on the slides for each lesson)

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?
Have at least one classmate you can contact for assistance 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
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.
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.
Predict structures of the prokaryotic cell that would be antibiotic targets. Compare/contrast synthesis of proteins that will remain in cell or be exported. Explain how disease can be caused when protein synthesis goes awry. Explain how insulin-producing cells are like dysfunctional factories when a person is diabetic (type 1 or type 2).
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.
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 mechanisms of chemical signaling to different pathways, such as insulin signaling and sex hormone signaling.
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.
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 <sup>+</sup> gradient and oxygen are both necessary for oxidative phosphorylation. Describe anaerobic respiration pathways and differentiate them from aerobic pathways.

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.

### Unit 2 Class Meeting Objectives

How do cells store, transmit and use genetic information to make proteins? What are the consequences for organisms when these processes go awry?
Contrast asexual and sexual reproduction in outcome and types of organisms/cells that use each Recognize/draw the stages of mitosis, contrasting animal and plant cells and explain the consequences 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 cell growth. Explain the significance of a mutated BRCA-1 gene in terms of risks and consequences and the “utility” of a gene test for actionable genes.
Define haploid, diploid, and homologous chromosomes and be able to calculate the diploid and haploid number when given an illustration of a cell. Draw how variation arises during meiosis from independent orientation at metaphase I. Describe the consequences of non-disjunction in the sex chromosomes in humans. Predict the outcome of specific non-disjunction events or determine in which parent non-disjunction occurred. Describe some ethical and medical issues arising from Downs Syndrome testing.
Construct Punnett squares. Determine mode of inheritance of a pedigree (autosomal dominant or recessive or X-linked recessive). 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)
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.
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.

### Unit 3 Class Meeting Objectives

How do the emergent properties of immunity, reproduction, and digestion arise from interacting components of these systems?
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
Describe the structure and function of male and female anatomy. Discuss prevention and consequences of various STDs.
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.
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.

#### Unit 4 Class Meeting 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?

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

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

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.

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.

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.

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.

#### BIOL 101.001 Fall 2019 :: Course Schedule :: Readings, Assignments, Quizzes, Exams

- You need the 9<sup>th</sup> edition of the textbook to complete these assignments
- Guided Reading Questions (GRQs) can be found on our Sakai site and turned in there, too.
- Mastering Biology assignments and quizzes are conducted online via [myportal.pearson.com](http://myportal.pearson.com)

<p><b>Class meeting Date</b></p> <p>UNIT 1: BIOCHEMISTRY AND CELL BIOLOGY</p>	<p><b>Lesson and Relevant Assignment(s)</b> Due 11:55 PM the night <b>before</b> class unless otherwise noted** Do GRQs first (readings listed in GRQ) and then do Mastering <i>(All GRQs turned in via Sakai)</i></p>	<p><b>Class Meeting Objectives</b> 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?</p>
<p>Weds Aug. 21</p>	<p>Register for Mastering with your UNC email account; sign up with Piazza, print/read syllabus and schedule</p>	<p>Introduce yourself to someone and obtained one class contact. 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>
<p>Mon. Aug 26 (assignment due Sunday, Aug 25)</p>	<p>Lesson #1 GRQs first and then Mastering assignments both by the names: 1) Introduction to Mastering 2) Exploring Life and the Process of Science  (Be sure to upload GRQs to Sakai Assignments) Be sure to bring your printed class outlines!</p>	<p>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>

Weds. Aug 28	GRQs first then and Mastering assignment: Lesson #2 Macromolecules: Structure and Function (Be sure to upload GRQs to Sakai)	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.
Mon. Sept 2	NO SCHOOL -- HOLIDAY	Catch up on reading and review notes!
Weds. Sept. 4	Lesson # 3 GRQs and Mastering: A Tour of the Cell (Be sure to upload GRQs to Sakai)	Predict structures of the prokaryotic cell that would be antibiotic targets. Compare/contrast synthesis of proteins that will remain in cell or be exported. Explain how disease can be caused when protein synthesis goes awry. Explain how insulin-producing cells are like dysfunctional factories when a person is diabetic (type 1 or type 2).
Mon. Sept. 9	Quiz 1 (on Mastering; timed; only one try per question on quizzes) <i>(Note: Quizzes only post about 3 days before they are due)</i> After taking quiz: Lesson #4: GRQs and Mastering: Structure and Function of Membranes	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.
Weds. Sept.11	Lesson # 5: GRQs and Mastering:	

	Cell Signaling Via Hormones	<p>Predict how water will move via osmosis and explain why this is critical to your cells.</p> <p>Describe how the two types of chemical signaling mechanisms affecting target cells differently.</p> <p>Apply the mechanisms of chemical signaling to different pathways, such as insulin signaling and sex hormone signaling.</p>
Mon. Sept.16	Lesson #6: GRQs and Mastering: The Energy and Enzymes of Cellular Respiration	<p>Explain the importance of enzymes in metabolism and how they are inhibited. Explain how ATP does work.</p> <p>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.</p> <p>Describe big picture of cellular respiration and how it relates to breathing.</p>
Weds. Sept 18	Lesson #7: Mastering and GRQs: Cellular Respiration	<p>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<sup>+</sup> gradient and oxygen are both necessary for oxidative phosphorylation.</p> <p>Describe anaerobic respiration pathways and differentiate them from aerobic pathways.</p>
Mon. Sept 23	<p>Quiz 2 (timed). After quiz: Lesson #8: GRQs and Mastering: Photosynthesis</p> <p>Practice Exam on Sakai under "Quizzes"***Due by TUESDAY Sept 24 at 11:55PM (This will be cumulative for exam prep.)</p>	<p>Describe where the mass of a tree comes from and explain how the "mass" is made.</p> <p>Explain how trees are carbon sinks.</p> <p>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.</p>

Weds. Sept 25	<p><b>EXAM 1</b></p> <p>Practice Exam on Sakai  ***Due by TUESDAY Sept 24 at 11:55PM</p> <p>(This will be cumulative for exam prep.)</p>	<p>EXAM 1 (Covers all material in Unit 1)</p> <p>Study powerpoints, GRQs, quizzes, 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.</p>
UNIT 2: GENETICS & MOLECULAR BIOLOGY		<p>How do cells store, transmit and use genetic information to make proteins?  What are the consequences for organisms when these processes go awry?</p>
Mon Sept 30	<p>Lesson #9: GRQs and Mastering:  Mitosis, Development, and cancer</p> <p>Print the outlines for this unit</p>	<p>Contrast asexual and sexual reproduction in outcome and types of organisms/cells that use each</p> <p>Recognize/draw the stages of mitosis, contrasting animal and plant cells and explain the consequences of specific stages of mitosis failing.</p> <p>Describe how cell division plays a role in development.</p> <p>Explain how cells know when it is time to divide/not divide.</p> <p>Explain how cancer cells disobey the rules that normal cells follow in the cell cycle and in cell growth.</p> <p>Explain the significance of a mutated BRCA-1 gene in terms of risks and consequences and the “utility” of a gene test for actionable genes.</p>
Weds. Oct 3	<p>Lesson #10: GRQs and Mastering:  1) Meiosis  2) Non-disjunction</p>	<p>Define haploid, diploid, and homologous chromosomes and be able to calculate the diploid and haploid number when given an illustration of a cell.</p> <p>Draw how variation arises during meiosis from independent orientation at metaphase I.</p>

		<p>Describe the consequences of non-disjunction in the sex chromosomes in humans.</p> <p>Predict the outcome of specific non-disjunction events or determine in which parent non-disjunction occurred.</p> <p>Describe some ethical and medical issues arising from Down's Syndrome testing.</p>
Mon. Oct 7	<p>Quiz 3 (timed): covers chapter 8</p> <p>After quiz: Lesson #11: GRQs (Pattern of Inheritance I) and Mastering: None</p>	<p>Construct Punnett squares.</p> <p>Determine mode of inheritance of a pedigree (autosomal dominant or recessive or X-linked recessive).</p> <p>Calculate probabilities when given pedigrees.</p>
Weds Oct 9	<p>Lesson #12: GRQs (Pattern of Inheritance II) and Mastering: Patterns in Inheritance</p>	<p>Design genetic crosses that determine if a trait is dominant or to determine an individual's genotype.</p> <p>Recognize and/or solve problems that are non-Mendelian variations of inheritance (incomplete dominance, co-dominance, multiple alleles, pleiotrophy, and polygenic traits)</p>
Mon. Oct 14	<p>Lesson #13: GRQs (Flow of Genetic Information I) and Mastering: None</p>	<p>Draw a basic model of DNA, being able to point out where DNA variation is part of the structure.</p> <p>Distinguish what makes somatic cells in the body similar and what makes them different.</p> <p>Trace a specific DNA sequence all the way to a protein.</p> <p>Calculate the variations in code that lead to the same protein.</p> <p>Calculate variation in proteins of same size.</p>
<p>Weds. Oct 16</p> <p><b>CLASS TODAY WILL BE OFFERED ONLINE VIA ZOOM</b></p> <p><b>*We will not meet in person.</b></p> <p>Reminders will be</p>	<p>Lesson #14: GRQs (Flow of Genetic Information II) and Mastering: Flow of Genetic Information</p> <p>Quiz 4 (timed)</p>	<p>Transcribe and translate two different alleles of a gene.</p> <p>Define an allele.</p> <p>Describe different types of mutations.</p>

sent closer to the date	Practice Exam on Sakai (look in quizzes) ***Due by Sunday Oct. 20 at 11:55PM	Use genetic and molecular data to determine an individual's phenotype.
Mon. Oct 21	<b>EXAM 2</b>	EXAM 2 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.
UNIT 3: ANATOMY & PHYSIOLOGY		How do the emergent properties of immunity, reproduction, and digestion arise from interacting components of these systems?
Weds Oct 23	Lesson #15: GRQs and Mastering: Immunity  Don't forget to print your outlines.	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
Mon Oct 28	Lesson #16: GRQs and Mastering: Reproduction part I	Describe the structure and function of male and female anatomy. Discuss prevention and consequences of various STDs.
Weds Oct 30	Lesson #17: GRQs and Mastering: Reproduction part II	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		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?
Mon. Nov 4	Quiz 5 (timed) After quiz:	Determine if two organisms are from the same species; be able to explain the benefits and draw-backs of different definitions of a species

	Lesson #18: GRQs and Mastering: Phenology and 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
Weds. Nov 6	Lesson #19: GRQs and Mastering: Populations	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
Mon Nov 11	Lesson #20: GRQs and Mastering: Community Interactions	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.
Weds Nov 13	Lesson #21: GRQs and Mastering: The microbiome Quiz 6 (timed) Practice Exam on Sakai ***Due by SUNDAY Nov 17 at 11:55PM	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.
Mon. Nov 18	<b>EXAM 3</b>	EXAM 3 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.

Weds Nov 20	Lesson #22: GRQs and Mastering: 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.
Mon Nov 25	Quiz 7 (timed) Lesson #23: GRQs and Mastering: How Populations Evolve	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.
Weds Nov 17	<b>NO SCHOOL-- THANKSGIVING BREAK</b>	<b>Make a study plan for the final exam!</b>
Mon. Dec 2	Lesson #24: GRQs and Mastering: Origin of Species	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.
Weds. Dec 4	Lesson #25: GRQs but there is no Mastering assignment	Wrap up course
Sat. Dec 7	<b>FINAL EXAM 4-7pm (room 100 in Genome Sciences)</b>	Cumulative (~70 questions) (Review objectives from each class, review powerpoints; review quizzes and

**\*If you have three final exams in 24hrs please let Dr. Evans know ASAP**

exams and Mastering; be active in your studying by quizzing yourself!)