Instructor: Dr. Kelly Hogan  
leek@email.unc.edu  
Office phone: 843-6047, Wilson Hall room 104B

Supplemental Instruction TAs:  
Sarah McShane (smcshane@live.unc.edu)  
Tony Boutelle (bouletle@live.unc.edu)  
*SI times/locations: TBA (see Sakai for information)

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 great deal of 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 readings and homework before class, coming to class ready to participate directly with peers and through in-class technology, and reviewing routinely for quizzes and exams. In this highly structured course, **we have evidence that every student can achieve if they are motivated to be an active learner!** A majority of students spend about 4-7 hrs per week on this course.

OFFICE HOURS: Don't feel intimidated if you've never been to a professor's office hours. You can come alone or sign-up with a friend. You can come in to talk about the course, study skills, mental health issues, your background, you career, advice for future courses to take, etc. I'm a Carolina First advocate, safe-zone trained (LBGTQ), and an advocate for Covenant students, Chancellor Science Scholars, transfer students, international students, continuing education students, underrepresented minority students, first year students, sophomores, students with silent and physical disabilities, students that require oxygen...ANY student!

Check “Sign-up” tool on Sakai menu to reserve a slot (and for any last minute additions/deletions to my hours for each week). My hours for each week will generally be:

- Mondays 9-10 AM
- Thursdays 1:30-2:30
- Fridays 12:15-1:15

(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.)

Peer support via PIAZZA: I’ll have hundreds of students this semester and know I cannot give you all the individual attention you deserve. I’ll ask that you become a community of scholars to help answer questions about the course logistics and course content. Piazza is tool that will help us do this and will help you find study buddies. I and the S.I. TAs, and course mentors will be checking in through Piazza occasionally, but it is expected that you will answer each other’s questions. I’ll be taking notice of students who are engaging here.  
Sign up here for free immediately at: piazza.com/unc/spring2016/biol101
SUPPLEMENTAL INSTRUCTION (SI): Your SI sessions will be offered 3-4 times a week. Each session will be scheduled for 1 hour. The times and location of these sessions will be posted on Sakai in the second week of class (rooms cannot be permanently scheduled until two weeks into the semester). 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 peers who don’t attend. I suggest you fit one into your schedule early in the semester and attend weekly as if it is a required class. Your SI instructors’ contact information is listed above.

Peer Mentors: We’ll have several peer mentors helping in class as we work on activities. Peer mentors are folks you can call over for help during class and meet up with outside of class. See Sakai for more information about mentor contacts and hours outside of class.

REQUIRED TEXT AND REQUIRED ONLINE MODIFIED MASTERING BIOLOGY ACCESS with ebook:
You are required to have the package with the ebook. You are not required to have a hard copy of the textbook on top of that. Having a hard-copy of the textbook is your choice. Please see Sakai for details about the different packages so you can spend your money most wisely. If you do not purchase materials via the UNC bookstore pay EXTRA CLOSE attention to the materials you must purchase on your own. Note: there are several hard-copy books on reserve at the Undergraduate Library.

Required reading: Particular chapters are required (see Guided Reading Questions (GRQs) for specific details). Question: Should you read and answer the GRQs before or after completing Mastering Biology homework assignments? Answer: BEFORE!

WHAT YOU SHOULD BRING TO CLASS EVERY DAY:

1. Completed Guided Reading Questions (GRQs) that you finished before class and can use as a reference. Find these posted on Sakai.
2. Blank Outlines (printed that you can had-write on). Note: educational research shows that students learn more by handwriting notes, despite how convenient we all feel a laptop is!
3. Extra blank paper for drawings, notes, activities etc. (or tablet computer for drawing)
4. 3 x 5 index cards to turn in to me during activities (with or without lines, preferably white).
5. A smart-device: enabled for UNC wi-fi and Learning Catalytics access. I prefer you use a smart phone for ease, but a laptop or tablet will work too.

Note: You may NOT rely on cellular service, 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/](http://help.unc.edu/help/connecting-to-the-unc-network-getting-started/)
COURSE COMPONENTS MAKING UP FINAL GRADE:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
<th>Description</th>
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<tbody>
<tr>
<td>HOMEWORK VIA MASTERING BIOLOGY:</td>
<td>(12% of grade)</td>
<td>Homeworks will be due generally every Sunday and Thursday night by 11:55 PM (see detailed schedule). 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. Late homeworks will receive zero credit, even though you can still do them for practice. See my Goal #1 below and realize that I am trying to help you to succeed by giving you these regular assessments. Assignments 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.</td>
</tr>
<tr>
<td>QUIZZES VIA MASTERING BIOLOGY:</td>
<td>(12% of grade)</td>
<td>You will be required to do online timed quizzes in Mastering Biology (MB Quizzes). These 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 HW. Missed quizzes = 0%. Unlike other assignments, quizzes post only about 3 days before they are due. Note: You must complete once started and you cannot go backwards on these questions. Students registered with ARS may need to contact the professor if accommodations are necessary.</td>
</tr>
<tr>
<td>PARTICIPATION VIA LEARNING CATALYTICS:</td>
<td>(10% of grade)</td>
<td>Most of this grade will come from Learning Catalytics, but completion of surveys and in class assignments may also be a part of this grade. Are you required to come to class? Are you required to pay attention? Are you required to discuss biology with your classmates during class? Nope, I cannot make you do any this. This is your education and you want to be a successful UNC student. I enjoy Instagram too, but please put it away and participate in your education! To participate, we’ll use Learning Catalytics (accessed through Mastering Biology) through your smart device. Note: these questions are to be done in class, you will receive a zero on this portion of your final grade if you are found to be answering questions from a distant location. How is LC graded? Many questions will be participation only. Some questions throughout the semester will be graded as correct/incorrect based on Guided Reading Questions and Team Based Review Days. 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. Please do not email me to tell me you were absent, we will have so many opportunities for participation that missing one or two days in the semester will not affect your grade (I will end up dropping a few points for every student to make accommodations for this for ALL students). If you have many excused absences due to extended illness, hold onto excuses until the end of the semester. Thanks.</td>
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<tr>
<td>INDIVIDUAL EXAMS (66% of final grade):</td>
<td></td>
<td>There will be three traditional exams given during the regular semester, and a cumulative final exam. The format will be multiple choice, 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. Students who use ARS: I will upload the file and ask that you return the exam to my office, if you are able. THERE ARE NO MAKE-UP EXAMS GIVEN. Only two of the three semester exams are used in your final grade. Thus, if you miss one exam due to athletics, family issues, medical reasons, I do not need to know about it (but hold onto your excused paperwork in case it is needed later in the semester!) If you miss two exams, and have sanctioned</td>
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</tbody>
</table>
excuses for missing both exams, please contact the professor. Make-up exams will not be identical to the class exam.

**HOW IS YOUR GRADE DETERMINED?**

If you take all three semester examinations:

The lowest exam grade is dropped and the total for the semester =

\[(0.22 \times \text{exam}) + (0.22 \times \text{exam}) + (0.22 \times \text{final exam}) + (0.12 \times \text{homework average}) + (0.10 \times \text{participation score}) + (0.12 \times \text{quiz score})\]

If you take any two semester exams:

Both the exams you took will count and the total for the semester =

\[(0.22 \times \text{exam}) + (0.22 \times \text{exam}) + (0.22 \times \text{final exam}) + (0.12 \times \text{homework average}) + (0.10 \times \text{participation score}) + (0.12 \times \text{quiz score})\]

**Converting your final average to a letter grade:**

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<thead>
<tr>
<th>Grade</th>
<th>Minimum Score</th>
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<tbody>
<tr>
<td>A</td>
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<tr>
<td>A-</td>
<td>90</td>
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<tr>
<td>B+</td>
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<td>C</td>
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<td>C-</td>
<td>70</td>
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<td>D</td>
<td>60</td>
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<tr>
<td>F</td>
<td>60 or less</td>
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</table>

(Note: there will be no changes to HOW your final average is calculated at the end of the semester...so please don’t ask!)

**STUDENT CONCERNS:** Many students like to complain that Biol 101 is a “weed out” course. Of course this is not true, but why does it have this reputation? 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 are wondering…is there a pre-determined number of students that receive a C, D, or F? Nope. 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 on the first day? My experience tells me that:

1) Some students do not have the active learning and studying skills that they should already have at the college level (It often takes these students an exam or two for them 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 course will require you to use your laptop and/or cell phone during class time. While I recognize that you are an excellent multi-tasker, research suggests that your peers are not. Please be respectful of your classmates and restrict your use of digital devices to course content. If we see that you or your peers are distracted, we will ask you to put your devices away or move you to the atrium, 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 (a wonderful thing!) but the classroom should be a place apart, 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 while you are here and your classmates will thank you for not impeding their ability to learn.

**SAKAI SITE** (you will need your onyen to log on)
This site will have postings from my lectures such as outlines, power point slides, old exams, 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.**

**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 actively study.** 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. 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 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 very 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 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. If I succeed in getting you to read some articles on your own, I will be a happy professor!

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 will you THRIVE this semester?**

**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, 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 on homeworks because they value the homeworks and videos as a tool to learn.
3. attend each class session prepared, stay engaged by hand-writing notes, and sit with peers that encourage them to participate and learn. (They move seats to find the peers they best learn from—not necessarily their friends.)
4. 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 in with a peer, are willing to talk to a classmate they don’t know.
5. review after each class for about 15-20 minutes to reflect on what was learned and what they still have questions about.
6. study before each Mastering Biology quiz, so as to prepare for them like a practice test.
7. review (on their own) every question from Mastering HW, GRQs, Quizzes, Learning catalytics, class, etc to see if they could TEACH it to someone else. Successful students don’t just simply get the right answer and move on, they are able to explain how someone arrives at this answer.
8. attend S.I., mentoring hours, tutoring hours, or study groups routinely because once they have done the work alone, they can collaborate and learn even more from others. (They often class and Piazza to meet study buddies.)
9. have a system for planning and keeping track of all deadlines.
10. 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/locations for office hours, S.I., mentoring, tutoring etc. will be posted on the front page of Sakai. Changes will be sent out via announcements. All materials you need (GRQs, outlines, powerpoints, old exams) are found in the resources folder of Sakai.

**Reach me through office hours, after class, 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. What suggestions can I have for you if you wait until you did 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 ideas about how you demonstrate you know something.) READING 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 responsible for adjudicating any suspected violations of the Honor Code and all suspected instances of academic dishonesty will be reported to the honor system. Your full participation and observance of the Honor Code is expected, including reporting others to me.
Action Verbs: Words to implement in your studying
When studying, try drawing, contrasting, arranging, etc.

<table>
<thead>
<tr>
<th>Type (Level)</th>
<th>Knowledge (1)</th>
<th>Comprehension (1)</th>
<th>Application (2)</th>
<th>Analysis (3)</th>
<th>Synthesis (3)</th>
<th>Evaluation (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bloom's Definition</td>
<td>Remember previously learned information.</td>
<td>Demonstrate an understanding of the facts.</td>
<td>Apply knowledge to actual situations.</td>
<td>Break down objects or ideas into simpler parts and find evidence to support generalizations.</td>
<td>Compile component ideas into a new whole or propose alternative solutions.</td>
<td>Make and defend judgments based on internal evidence or external criteria.</td>
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<tr>
<td>Verbs</td>
<td>• Arrange</td>
<td>• Classify</td>
<td>• Analyze</td>
<td>• Arrange</td>
<td>• Appraise</td>
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<td>• Define</td>
<td>• Convert</td>
<td>• Appraise</td>
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<td>• Label</td>
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<td>• Dramatize</td>
<td>• Diagram</td>
<td>• Construct</td>
<td>• Conclude</td>
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<td>• Match</td>
<td>• Explain</td>
<td>• Employ</td>
<td>• Differentiate</td>
<td>• Create</td>
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<td>• Memorize</td>
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<td>• Name</td>
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<td>• Interpret</td>
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<td>• Examine</td>
<td>• Devise</td>
<td>• Discriminate</td>
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<td></td>
<td>• Outline</td>
<td>• Give example(s)</td>
<td>• Modify</td>
<td>• Experiment</td>
<td>• Devise</td>
<td>• Estimate</td>
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<td>• Recognize</td>
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<td>• Relate</td>
<td>• Indicate</td>
<td>• Practice</td>
<td>• Identify</td>
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<td>• Recall</td>
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<td>• Repeat</td>
<td>• Locate</td>
<td>• Prepare</td>
<td>• Model</td>
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<td>• Reproduce</td>
<td>• Paraphrase</td>
<td>• Produce</td>
<td>• Outline</td>
<td>• Interpret</td>
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<td>• Select</td>
<td>• Predict</td>
<td>• Relate</td>
<td>• Schedule</td>
<td>• Outline</td>
<td>• Relate</td>
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<tr>
<td></td>
<td>• State</td>
<td>• Paraphrase</td>
<td>• Schedule</td>
<td>• Show</td>
<td>• Point out</td>
<td>• Relate</td>
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</tbody>
</table>

What kinds of questions do you have trouble with on quizzes/exams? Knowledge or application? Practice what you have trouble with.
Course Schedule/Topics for Discussion*

For each assignment, you have a “Guided Reading Assignment (GRQ)” with the same title that you should do before doing Mastering Homework. (See each GRQs for the specific pages to read from the text, etc).

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 reading, you are missing a large chunk of information I expect you to be familiar with. You are ultimately responsible for information in “Guided Reading” as if these are lectures. Not doing these = missing at least a third or one-half of the course content.
Due dates are subject to change (such as with weather) but it is VERY unlikely exam dates would ever change.

Homework assignments are shown in red. Late homework assignments = 0%

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>In-class Objectives (tip: use these to study too)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 1/11</td>
<td>Introduction and Pre-test</td>
<td>Describe course components and make introductions. (Bring a #2 pencil and scantron—purchase at student stores)</td>
</tr>
</tbody>
</table>

Due Tuesday 1/12 by 11:55 PM: *Guided Reading Qs (GRQs) + Two Mastering assignments:
1) Introduction to Mastering and
2) Exploring Life and the Process of Science
*Note: Guided Reading Questions are not turned in.

Don’t forget to print your Class Outlines and bring to class!!

W 1/13   The process of Science    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) Formulate a testable hypothesis and design a controlled experiment.

--UNIT 1 BIOCHEMISTRY & CELL BIOLOGY--
Due Thursday 1/14 (by 11:55 PM): GRQs + Macromolecules (on Mastering)

F 1/15    Macromolecules           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.

M 1/18    NO CLASS (MLK Day)      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.

W 1/20    Macromolecules           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.

Due Thursday 1/21: GRQs + A tour of the Cell (on Mastering)

F 1/22    A Tour of the cell      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.

Due Sunday 1/24 HW: MB Quiz 1 (timed) and then GRQS + Structure and Function of Membranes
<table>
<thead>
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<th>Topic</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 1/25</td>
<td>Cell cont. &amp; Membranes</td>
<td>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. Discriminate between passive transport, active transport, and bulk transport of molecules across a membrane.</td>
</tr>
<tr>
<td>W 1/26</td>
<td>Membranes cont.</td>
<td>Predict how water will move via osmosis and explain why this is critical to your cells.</td>
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</tbody>
</table>

**Due Thursday 1/27:** GRQs + Cell signaling via hormones

**F 1/28**

**Sunday 1/31 HW: GRQs + Energy and Enzymes**

**M 2/1** Energy /Enzymes

**W 2/3** Cellular Respiration

**Due Thursday 2/4:** MB Quiz 2 (timed) and then GRQs and Cellular Respiration

**F 2/5** Cellular Respiration

**Due Sunday 2/7 HW: GRQs + Photosynthesis**

**M 2/8** Photosynthesis

**W 2/10** Team Based Review via Learning Catalytics

_**No Homework due Thursday. Be sure to do the “practice exam” on Sakai to see a REAL Dr. Hogan exam! 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 2 GENETICS—

Don’t forget to print your new class outlines

Due Sunday 2/14: GRQs + Cell division, Development, and cancer

M 2/15  Cell division, Dev. & Cancer
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.

W 2/17  T.B.D.

Due Sunday 2/14: Reflection (see Sakai announcement for details)

F 2/19  Cancer cont.
Explain how cells know when it is time to 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.

F 2/19  Cancer cont.

Due Sunday 2/21: GRQs + Meiosis

M 2/22  Meiosis
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.
Calculate the contribution of uniqueness that comes from independent orientation, crossing over, and random fertilization.

W 2/24  Inheritance
Construct Punnett squares.
Design genetic crosses that determine if a trait is dominant or to determine an individual’s genotype.
Calculate probabilities when given pedigrees.

Due Thursday 2/25: MB Quiz 3 (timed) and then GRQs + Patterns in Inheritance

F 2/26  Inheritance cont.
Calculate probabilities when given pedigrees.
Recognize and/or solve problems that are non-Mendelian variations of inheritance (incomplete dominance, co-dominance, multiple alleles, pleiotrophy, and polygenic traits)

Due Sunday 2/28: GRQs + Nondisjunction+ Flow of Genetic Information

M 2/29  Nondisjunction
Describe the consequences of non-disjunction in the sex chromosomes in humans.
Draw non-disjunction in meiosis I or meiosis II and predict the outcome of these events.
Describe some ethical and medical issues arising from Downs Syndrome testing.
Recognize abnormalities and name/describe when given a karyotype.

W 3/2  Flow of Genetic Information
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.
Name all the components of translation and how they function.
Compare and contrast the processes and outcomes of transcription and translation. Trace a specific DNA sequence all the way to a protein.

**Due Thursday 3/3: MB Quiz 4 (timed)**

*F 3/4 Flow of Genetic Information*

Transcribe and translate two different alleles of a gene. Describe the steps involved in how DNA information is used to make proteins, including the molecular players and the location of each step. Explain how the correct amino acid is added to the growing polypeptide.

**Be sure to do the “practice exam” on Sakai to see a REAL Dr. Hogan exam! Study powerpoints, GRQs, class notes and all your LC questions! Dynamic study modules and “study area” of Mastering.**

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**M 3/7 EXAM 2**

**All material from Unit 2**

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**--UNIT 3 EVOLUTION & ECOLOGY--**

*W 3/9 Introduction to Evolution*

Distinguish components of the theory of natural selection that are true vs. common misconceptions. Distinguish creationist, theistic, 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.

**Due Thursday 3/10: GRQs + How Populations Evolve**

*F 3/11 How Populations Evolve*

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.

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***********SPRING BREAK***********

**No homework on Sunday 3/20 but note homework that is due on TUESDAY night!!**

*M 3/21 How Populations Evolve*

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.

**Due Tuesday 3/22: GRQs + Origin of Species**

*W 3/23 Origin of Species*

Explain the uses for the biological species concept of species and its limitations. Define the conditions that lead to speciation. Distinguish various reproductive barriers that keep species separate. Explain how plants diverge into two new species in one generation.

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**F 3/25 NO CLASS; HOLIDAY**

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**Due Sunday 3/27: MB Quiz 5 (timed) and then GRQs + Common Ancestors + Adaptations**

*M 3/28 Common ancestors*

Construct a phylogenetic tree when given morphological data and a list of organisms. Hypothesize how dogs may have evolved from a wolf-like ancestor.

*W 3/30 Adaptations*

Describe the features that helped vertebrates transition from water to land.
Given data about fossils with features of fish and tetrapods, determine the lineage for tetrapod evolution. State a hypothesis for why humans are hairless, unlike other mammals.

Due Thursday 3/31: GRQs + Population Ecology
F 4/1 Population Ecology

Explain how scientists estimate population size and perform a calculation to estimate student population in our classroom. Use the exponential growth model to calculate population growth. Compare and contrast logistic and exponential models of growth.

Due Sunday 4/3: GRQs + Interactions within Communities + The Microbiome
M 4/4 Populations & Communities

Describe what happens to population size, death rates, and birth rates as countries become developed. Compare ecological footprints. 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.

W 4/6 The microbiome

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 ANATOMY & PHYSIOLOGY (A & P)--

Due Thursday 4/7 MB Quiz 6 (timed) then GRQs and Homeostasis
F 4/8 Homeostasis

Explain how “emergent properties” arise from the structure and function of individual components of a system. Define homeostasis and explain how homeostasis is maintained. Give examples of homeostasis in the body and the consequences of imbalance. Define the characteristics of cells/ tissues/organisms that make for efficient exchange.

Due Sunday 4/10 GRQs and Reproduction part I
M 4/11 Reproduction

Draw spermatogenesis and how it relates to meiosis. Draw the structure of a sperm and relate it to its function and journey.

W 4/13 Reproduction

Draw oogenesis in a diploid cell and compare and contrast to spermatogenesis. Explain the purpose of the HPV vaccine.

Due Thursday 4/14 GRQs and Reproduction part II and MB Quiz 7 (timed)
F 4/15 Reproduction

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.

Study powerpoints, GRQs, class notes and all your LC questions. Dynamic study modules and “Study area” in Mastering.

M 4/18 EXAM 3 All material from UNIT 3 and part of UNIT 4 (including reproduction).
W 4/20 Immunity

Describe the body’s innate defenses and how they differ from adaptive defenses.

Due Thursday 4/21 GRQs and Immunity

F 4/22 Immunity

Compare and contrast humoral and cell-mediated immunity. Explain how the adaptive system’s “memory” and “specificity” relate to how flu vaccines work and why someone can’t have the chicken pox twice.

Sunday 4/24, no homework.

M 4/25 Immunity cont.

Describe the consequence of not having functional helper T cells.

W 4/27 Team Based Review via Learning Catalytics

Study and Review, especially material from earlier in the semester!

FRIDAY May 6th 12-2:30 PM Final exam (cumulative, ~70 questions) In GSB 100
http://registrar.unc.edu/academic-calendar/final-examination-schedule-spring/

* 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.