**Syllabus/Schedule for Biology 101: Fall 2019**

**Principles of Biology (Section 002)**

*T-Th: 12:30-1:45PM;* *GSB 100*

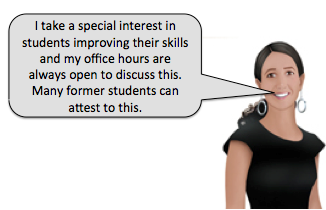
**Instructor:** **Dr. Alaina Garland**

[agarland@email.unc.edu](mailto:Kelly_Hogan@unc.edu); Wilson Hall room 135

**Supplemental Instructors** and **Peer mentors:** Please see Sakai homepage during the first week of classes

**Learning Center Biology Specialist**: Robin Blanton ([rcb@email.unc.edu)](mailto:rcb@email.unc.edu))

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!***



**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!

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

*(Come alone or with a friend. I may add hours some weeks as my schedule allows or see individuals outside of these hours if necessary. If you can’t make these hours, we can schedule a time.)*

**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, the SIs, 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/fall2019/biol101

**SUPPLEMENTAL INSTRUCTION (SI):** Your SI sessions will be offered several 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. You are not required to attend SI, but it is highly recommended. 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 on the Sakai site.

**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 for more “one on one” help. See Sakai for more information about each mentor’s contacts and hours outside of class.

**Bio Cell** **with Biology Specialist**: Feel you need more review and more in-depth help? Attend these weekly review sessions on Mondays with Robin Blanton at the Learning Center.

**REQUIRED TEXT AND REQUIRED ONLINE MODFIED MASTERING BIOLOGY ACCESS with ebook:**

Campbell Biology, Concepts and Connections, **9th Edition** by Reece, et al.

You should receive an email from [digitaldelivery@unc.edu](mailto:digitaldelivery@unc.edu) with a code to purchase your textbook/Mastering biology/Learning Catalytics package. 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. (Immediate, free temporary access is available online if you are waiting for a package to arrive.) If you do not purchase materials via the UNC bookstore, please 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 hand-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. 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/

**COURSE COMPONENTS MAKING UP FINAL GRADE:**

**HOMEWORK VIA MASTERING BIOLOGY: (10% of your grade).** Homeworks will be due generally every Sunday, Tuesday, 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 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 homework 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.

**QUIZZES VIA MASTERING BIOLOGY: (8% of your grade).** 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. 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.

**PARTICIPATION (7% of your grade):** Most of this grade will come from Learning Catalytics, but completion of surveys, in class assignments, or other 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 Snapchat 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 via groups. 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, do let me know.

**INDIVIDUAL EXAMS (75% of final grade)**: 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.** Make-up exams will not be identical to the class exam, and will only be given for university-sanctioned absences WITH DOCUMENTATION AND PRIOR PERMISSION FROM INSTRUCTOR.

**HOW IS YOUR GRADE DETERMINED?**

If you take all three semester examinations:

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

(0.25 x exam) + (0.25 x exam) + (0.25 x final exam) + (0.10 homework average) + (0.07 participation score) + (0.08 quiz score)

If you take any two semester exams:

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

(0.25 x exam) + (0.25 x exam) + (0.25 x final exam) + (0.10 homework average) + (0.07 participation score) + (0.08 quiz score)

***Converting your final average to a letter grade:***   
A = or greater than: 93 C+ = or greater than: 77  
A- = or greater than: 90 C = or greater than: 73  
B+ = or greater than: 87 C- = or greater than: 70  
B = or greater than: 83 D = or greater than: 60

B- = or greater than: 80 F is less than: 60 (or a score of 45% or less on the final exam)

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

**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:**

**Should you take notes by hand or on the laptop?Research suggests taking notes by hand is the way to go! You will have class outlines that you should print before class and write and draw on. Much of biology is about drawing, so a laptop just won’t be useful. Ideally, you will use your smartphone if you have one for Learning Catalytics and not bring a laptop. Powerpoints will only be posted after class.**

**Digital Etiquette**

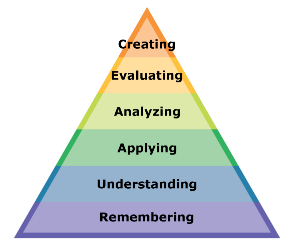
This course will require you to use your laptop and/or cell phone during class time. While I recognize that you are an excellent multi-tasker, research suggests that your peers are not. Please be respectful of your classmates and restrict your use of digital devices to course content. If we see that you or your peers are distracted, we will ask you to put your devices away or ask you to leave the class, 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, 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*.

Powerpoints will be posted after class.

**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, you identify what you don’t know. Making mistakes is KEY to learning. It makes more sense to make mistakes on homeworks and in-class when the stakes are 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 veryskilled 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 interact with peers that encourage them to participate and learn.

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 use Piazza and class time to meet peers.)

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 or posted on Piazza.

All materials you need (GRQs, outlines, powerpoints, old exams) are found in the resources folder of Sakai.

***How to prepare for an exam?*** UseGRQs, 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!

Reach me through office hours, after class, or by email. 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?

**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.

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| **Type**  **(Level)** | **Knowledge**  **(1)** | **Comprehension**  **(1)** | **Application**  **(2)** | **Analysis**  **(3)** | **Synthesis**  **(3)** | **Evaluation**  **(3)** |
| **Bloom’s**  **Definition** | Remember  previously  learned information. | Demonstrate an  understanding of  the facts. | Apply knowledge  to actual  situations. | Break down  objects or ideas  into simpler parts and find evidence to support generalizations. | Compile  component  ideas into a new whole or propose alternative solutions. | Make and defend judgments based  on internal evidence or external criteria. |
| http://www.learnnc.org/lp/media/misc/2008/blooms_new.png**Verbs** | • Arrange  • Define  • Describe  • Duplicate  • Identify  • Label  • List  • Match  • Memorize  • Name  • Order  • Outline  • Recognize  • Relate  • Recall  • Repeat  • Reproduce  • Select  • State | • Classify  • Convert  • Defend  • Describe  • Discuss  • Distinguish  • Estimate  • Explain  • Express  • Extend  • Generalized  • Give example(s)  • Identify  • Indicate  • Infer  • Locate  • Paraphrase  • Predict  • Recognize  • Rewrite  • Review  • Select  • Summarize  • Translate | • Apply  • Change  • Choose  • Compute  • Demonstrate  • Discover  • Dramatize  • Employ  • Illustrate  • Interpret  • Manipulate  • Modify  • Operate  • Practice  • Predict  • Prepare  • Produce  • Relate  • Schedule  • Show  • Sketch  • Solve  • Use  • Write | • Analyze  • Appraise  • Breakdown  • Calculate  • Categorize  • Compare  • Contrast  • Criticize  • Diagram  • Differentiate  • Discriminate  • Distinguish  • Examine  • Experiment  • Identify  • Illustrate  • Infer  • Model  • Outline  • Point out  • Question  • Relate  • Select  • Separate  • Subdivide  • Test | • Arrange  • Assemble  • Categorize  • Collect  • Combine  • Comply  • Compose  • Construct  • Create  • Design  • Develop  • Devise  • Explain  • Formulate  • Generate  • Plan  • Prepare  • Rearrange  • Reconstruct  • Relate  • Reorganize  • Revise  • Rewrite  • Set up  • Summarize  • Synthesize  • Tell  • Write | • Appraise  • Argue  • Assess  • Attach  • Choose  • Compare  • Conclude  • Contrast  • Defend  • Describe  • Discriminate  • Estimate  • Evaluate  • Explain  • Judge  • Justify  • Interpret  • Relate  • Predict  • Rate  • Select  • Summarize  • Support  • Value |

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\***

**BIOL 101.002 Fall 2019 :: Course Schedule :: Readings, Assignments, Quizzes, Exams**

* **You need the 9th 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

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| |  |  |  | | --- | --- | --- | | **Class meeting**  **Date** | **Lesson and Relevant Assignment(s)**  Due 11:55 PM the night **before** class unless otherwise noted\*\*  Do GRQs first (readings listed in GRQ) and then do Mastering  *(All GRQs turned in via Sakai)* | **Class Meeting Objectives** | | UNIT 1: BIOCHEMISTRY AND CELL BIOLOGY |  | 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? | | Tues Aug. 20 | Register for Mastering with your UNC email account; sign up with Piazza, print/read syllabus and schedule | 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 | |  | |  |  | |  |  | | Thurs Aug 22  (assignment due Wed, Aug 21) | 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! | 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. | |  | |  | |  | |  | |  | |  |  | | Tue Aug 27 | 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. | |  | |  | |  | |  | |  | | Thurs Aug 29 | 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). | |  | |  | |  | | Tue Sept 3 | Quiz 1 (on Mastering; timed; only one try per question on quizzes)  *(Note: Quizzes only post about 3 days before they are due)*  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. | |  | |  | |  | |  |  | | Thurs Sept 5 | Lesson # 5: GRQs and Mastering:  Cell Signaling Via Hormones | 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. | |  | |  | |  | | Tues Sept 10 | Lesson #6: GRQs and Mastering:  The Energy and Enzymes of Cellular Respiration | Explain the importance of enzymes in metabolism and how they are inhibited.  Explain how ATP does work.  List the inputs and outputs of aerobic cellular respiration and describe the big picture for why cells use this process.  Explain how coenzymes are reduced during respiration and how this contributes to ATP formation.  Describe big picture of cellular respiration and how it relates to breathing. | |  | |  | |  |  | |  |  | | Thurs Sept 12 | Lesson #7: Mastering and GRQs:  Cellular Respiration | Diagram the major stages of aerobic respiration, noting the location in the cell and the inputs and outputs of each stage.  Explain how a H+ gradient and oxygen are both necessary for oxidative phosphorylation.  Describe anaerobic respiration pathways and differentiate them from aerobic pathways. | |  | |  | | Tues Sept 17 | Quiz 2 (timed).  After quiz:  Lesson #8: GRQs and Mastering:  Photosynthesis    Practice Exam on Sakai under “Quizzes”\*\*\*Due by WEDNESDAY Sept 18 at 11:55PM  (This will be cumulative for exam prep.) | Describe where the mass of a tree comes from and explain how the “mass” is made. | |  | Explain how trees are carbon sinks. | |  | Describe the two parts of photosynthesis and the inputs and outputs of both parts. | |  | Explain what kind of sunlight is used by the plant and why sunlight is necessary. | |  | Explain photophosphorylation in the light reactions of photosynthesis, and describe how photophosphorylation is similar and different from the oxidative phosphorylation in aerobic respiration. | |  |  | |  |  | |  |  | | Thurs Sept 19 | **EXAM 1** | EXAM 1 (Covers all material in Unit 1) | |  | Practice Exam on Sakai \*\*\*Due by WEDNESDAY Sept 18 at 11:55PM | 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. | |  | (This will be cumulative for exam prep.) |  | |  |  |  | | UNIT 2: GENETICS & MOLECULAR BIOLOGY |  | How do cells store, transmit and use genetic information to make proteins? What are the consequences for organisms when these processes go awry? | |  |  |  | | Tues Sept 24 | Lesson #9: GRQs and Mastering:  Mitosis, Development, and cancer    Print the outlines for this unit | 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. | |  | |  | |  | |  | |  | | Thurs. Sept 26 | Lesson #10: GRQs and Mastering:  1) Meiosis  2) Non-disjunction | 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. | | Tues. Oct 1 | Quiz 3 (timed): covers chapter 8    After quiz:  Lesson #11: GRQs (Pattern of Inheritance I) and Mastering: None | Construct Punnett squares. | |  | Determine mode of inheritance of a pedigree (autosomal dominant or recessive or X-linked recessive). | |  | Calculate probabilities when given pedigrees. | |  |  | |  |  | | Thurs Oct 3 | Lesson #12: GRQs (Pattern of Inheritance II) and Mastering:  Patterns in Inheritance | 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) | | Tues. Oct 8 | Lesson #13: GRQs (Flow of Genetic Information I) and Mastering: None | Draw a basic model of DNA, being able to point out where DNA variation is part of the structure. | |  | Distinguish what makes somatic cells in the body similar and what makes them different. | |  | Trace a specific DNA sequence all the way to a protein. | |  | Calculate the variations in code that lead to the same protein. | |  |  | Calculate variation in proteins of same size. | | Thurs. Oct 10 | Lesson #14: GRQs (Flow of Genetic Information II) and Mastering:  Flow of Genetic Information  Quiz 4 (timed)  Practice Exam on Sakai (look in quizzes) \*\*\*Due by MONDAY Oct. 14 at 11:55PM | 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. | |  |  |  | | Tues. Oct 15 | **EXAM 2** | 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? | |  |  |  | | Tues Oct 22 | 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 | |  |  | | Thurs Oct 24 | 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. | | Tues Oct 29 | 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? | | Thurs. Oct 31 | Quiz 5 (timed)  After quiz:    Lesson #18: GRQs and Mastering:  Phenology and Species | 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 | |  |  | |  |  | | Tues. Nov 5 | 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 | | Thurs Nov 7 | 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. | | Tues Nov 12 | Lesson #21: GRQs and Mastering:  The microbiome  Quiz 6 (timed)  Practice Exam on Sakai \*\*\*Due by WEDNESDAY Nov 13 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. | |  |  |  | | Thurs. Nov 14 | **EXAM 3** | 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. | | Tues Nov 19 | 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. | | Thurs Nov 21 | 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. | | Tues. Nov 26 | 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. | | Thurs Nov 27 | NO SCHOOL-- THANKSGIVING BREAK | Make a study plan for the final exam! | | Tues. Dec 3 | Lesson #25: GRQs but there is no Mastering assignment |  | |  |  | Wrap up course | | Friday Dec 6 | **FINAL EXAM 12-3pm (room 100 in Genome Sciences)**  **\*If you have three final exams in 24hrs please let Dr. Garland know ASAP** | Cumulative (~70 questions)  (Review objectives from each class, review powerpoints; review quizzes and exams and Mastering; be active in your studying by quizzing yourself!) | |  |  | |  |  |