**Genetics and Molecular Biology (BIOL 202)**

*Spring 2018 Section 006*

Dr. Elizabeth Shank  
Dr. Kevin Slep  

Tues & Thurs 2:00-3:15, GSB200

**INSTRUCTORS:**  
Dr. Elizabeth Shank  
eshank@unc.edu  
Dr. Kevin Slep  
kslep@bio.unc.edu

**OFFICE HOURS:**  
Dr. Shank: Monday 12 – 1 pm in GSB 4157  
Dr. Slep: Thursdays 12 – 1 pm in Fordham 402

*Note that these standing office hours only apply during the days we are individually teaching.*  
*We are also available by appointment. Please contact us to meet outside of the times listed here.*

**GRADUATE TEACHING ASSISTANTS:**  
Kayla Goforth  
kaylago@live.unc.edu  
Matt Niederhuber  
mniederhuber@email.unc.edu  
Katie Metz  
ksmetz@email.unc.edu

**RECITATIONS:**  
601 Tu 3:30-4:20  Matt  Location: Wilson 213  
602 Tu 4:30-5:20  Matt  Location: Wilson 213  
603 Tu 5:30-6:20  Kayla  Location: Wilson 213  
604 Tu 6:30-7:20  Kayla  Location: Wilson 213  
605 We 3:30-4:20  Katie  Location: Wilson 213  
606 We 4:30-5:20  Katie  Location: Wilson 213  
607 We 5:30-6:20  Kayla  Location: Wilson 213  
608 We 6:30-7:20  Kayla  Location: Wilson 213

**UNDERGRADUATE SUPPLEMENTAL INSTRUCTORS and PEER MENTORS:**  
Megan Happ  
megannh@live.unc.edu  
Julia Skelton  
juliaju@live.unc.edu  
Leela Wissman  
leelalee@live.unc.edu  
Alexandra Barnett  
ambarn@live.unc.edu  
Sasha Kondrasov  
sashakon@live.unc.edu

**COURSE PREREQUISITES:**  
Basic knowledge of biology and chemistry as demonstrated by a C or above in BIOL 101 and CHEM 101 or 102 or equivalent.
COURSE GOALS:
1. To provide you with the core principles of genetics and molecular biology.
   The lecture and the book will provide the basic content. We will take a historical approach at times to see how
   famous experiments were performed. We will examine the basic “rules” of genetics that may then be
   altered to account for more complex situations. After this class, you will be prepared to do research
   in a lab on campus and to build upon this content with Biol 205 and upper level genetics courses.

Amended Bloom’s Taxonomy: developed as a method of classifying educational goals for student
performance evaluation. You should think about this as you study for exams and ask yourself, am I using
different kinds of thinking?

2. To gain higher level thinking skills.
   To the right you can see the “Amended Bloom’s Taxonomy” pyramid. It was developed as a
   method of classifying educational goals for student performance evaluation. You should be
   well-equipped at remembering facts and content with good study habits. We are looking for you to apply and
   analyze. You are UNC students, we KNOW you can memorize! Move beyond this level of thinking. How can we
   achieve this? We will have in-class questions to practice this immediately and you will have homework problems
   to practice on your own. We will also explore classic experiments as a way of thinking through the logic of
   experiments and to see where the foundations of this content come from. While these may be new ways of
   thinking for you, practice is the most important way to gain these skills. FYI: UNC’s medical school sees this is an
   excellent pre-req course for medical school because it teaches students to think.

3. This course should excite you about basic science and its applications.
   A foundation in genetic crosses with model organisms (basic science tool) allows you to understand human
   genetic diseases. A foundation in making recombinant DNA constructs (basic science tool) allows you to
   understand how plants are modified to be herbicide resistant or how recombinant proteins can be turned into
   medicines. Genetics and molecular biology provide the “tools” that other disciplines call upon in biological
   research. Plant biologists, evolutionary biologists, clinical researchers etc. all use these tools.

COURSE LEARNING OUTCOMES:
Upon completion of Biology 202, a student should be able to:

Skills:
• Build hypotheses to answer a specific scientific question, design an experiment using an appropriate
  technique/assay to answer the question, and predict results of their experiment.
• Give examples of how advances in genetics and molecular biology, from the discovery of DNA’s structure to
  sequencing individual genomes, have changed the world (examples include recombinant insulin,
  personalized medicine, transgenic crops)

Concepts:
• Explain the term “allele” for a single gene at a population, organismal, cellular, and molecular level;
  explain how dominance and recessiveness are expressed at these levels.
• Explain where genetic variation comes from in a population (e.g. from meiosis, mutation, and
  epigenetic changes).
• Predict genotypic and phenotypic ratios of offspring in defined genetic crosses and work these
  problems in reverse (when given data about offspring, determine the genotypes and phenotypes of
  the parents).
• Deduce modes of inheritance (example: autosomal dominance, x-linked recessive) from genetic pedigrees and explain how incomplete penetrance and variable expressivity complicate these analyses.
• Distinguish single gene traits from polygenic traits and the influence of the environment on traits.
• Explain how DNA is replicated normally and abnormally and how these concepts are utilized in the polymerase chain reaction (PCR).
• Compare and contrast the consequences of germline errors during meiosis (such as non-disjunction, and translocations) and somatic errors during abnormal mitosis (such as non-disjunction and cancer)
• Explain the flow of genetic information, based on the central dogma- from DNA to proteins and how mutations are carried through this flow of information.
• Describe the nature of the genetic code
• Describe the general organization of prokaryotic and eukaryotic genomes, including the identification and significance of the different parts of a gene (e.g. regulatory/non-regulatory, exons/introns; transcription start site; translation start site; UTRs)
• Explain how a gene can be regulated transcriptionally and post-transcriptionally and how this leads to limited expression under different conditions (such as in different environments, during the course of development, or disease conditions)
• Predict the outcome of experimental manipulations in genes (e.g. GFP-tagging to investigate gene expression)
• Describe the basic steps in gene cloning (restriction, ligation, etc.)
• Design a transgenic animal/bacteria, where a protein of interest is specifically produced
• Explain the significance of research in genetic model organisms to understand fundamental biological phenomena.

EXPECTATIONS:
The course is composed of three class meetings and one recitation session each week. Please note that this is not a class for passive learners. You are expected to be actively engaged in this course through class discussions, class activities and pre- as well as post-lecture assignments and readings. It is expected that you will spend several hours reading/working problems associated with each class. If you stay on top of your reading and homework, there will be no need to cram for an exam. Practice, practice, and practice more. Use the internet or other textbooks in the library to find more problems if you run out from your textbook.

You are expected to stay on top of reviewing the material weekly. Successful students review routinely. Really. Don’t wait. Attend SI sessions to review material with your SI leaders, do one-on-one meetings with peer mentors from class or visit the Learning Center learning specialists. Successful students ask questions and get help, ROUTINELY!
REQUIRED TEXT AND REQUIRED ONLINE MASTERING GENETICS ACCESS:

Feel free to choose a physical book or the ebook.

**Required:** Access to Mastering Genetics the online activity and homework tool. This comes included with a NEW physical textbook or ebook, but can be purchased separately if you buy a used book. If you have a used physical book, you can buy the Mastering Genetics access card at the bookstore but be aware that the cost of the access and a used book may be greater than purchasing a new book.

REQUIRED READING:

Particular chapters are required (see course outline for “Guided Reading” details) and you will be expected to have read them before class so that you can complete the Mastering Genetics homework assignments and be able to participate fully in the in-class activities. Some additional required reading material will be posted on Sakai.

SAKAI SITE:

You must have an onyen to log on – if you do not have an onyen, go to https://itsapps.unc.edu/improv/#UserCreateOnyenPlace:createOnyen.

The Sakai site will have postings from lectures such as outlines, power point slides, and supplemental material we mention in lecture. I will also post announcements regarding student concerns on this site. *It is your responsibility to check it regularly.* The URL for our course is https://sakai.unc.edu/portal/site/biol202.006.SP18

ASSIGNMENTS OVERVIEW:

During the semester you will have pre-class, in-class, and post-class assignments.

- The pre-class assignments will be based on assigned readings from the textbook. The assignments will be given via the MasteringGenetics system.
- In-class assignments will include Learning Catalytics and other activities.
- Post-class assignments will include timed MasteringGenetics Quizzes (MG Quiz) and occasionally Peerwise assignments and Open ended (OE) Homework Assignments.

All assignments’ due dates appear on the detailed schedule. Updates will be announced on Sakai. **You are responsible for submitting the assignments on time.** There will be no “second chances”.

HOMEWORK VIA MASTERING GENETICS (MA): (10% of your grade)

Homework will be due the morning before almost every class period at 11:00AM. Realize that we are trying to help you to succeed by giving you these regular assessments. Note that some assignments will take you as little as 15 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 before the deadline. To be safe, assume your clock is 5 minutes slower than the official Mastering Genetics time. Late homework will receive zero credit, even though you can still do them for practice. **DO NOT ASK US TO MAKE AN EXCEPTION TO THIS RULE.** It is YOUR responsibility to finish the homework early so that any late-evening crises do not prevent your finishing on time. Do not count on the Mastering program to give an accurate account of how long an assignment will take. These estimates can be wildly wrong!

See the “Student_Registration_Handout” in the Syllabus folder on Sakai for information on how to register for Mastering Genetics. You should be going to the webpage https://www.pearsonmylabandmastering.com/northamerica/ to login. Our class login is: shank60167
LEARNING CATALYTICS: (6% of your final grade)
As an incentive to come to class and be engaged, 6% of your grade will come from a program called Learning Catalytics that you use through your laptop or mobile phone. Note - missing just a couple of classes can quickly affect your participation grade! You can access LC through Mastering Genetics or by using the “session ID” the instructor will provide for each class.
**Learning Catalytics is to be done with students who are in the classroom participating. If you are found answering and you are not in the classroom, you may receive a zero for your grade for the semester.

TESTS: (three midterms each worth 18% of your final grade, the final constitutes 20% of your final grade)
There will be three tests and a cumulative final exam given. The format will be multiple choice and short answer so you will need to bring two #2 pencils and a scantron form purchased at the bookstore to the test. With the exception of the final, these are not cumulative tests and will only cover the material specified on the course schedule. To see your scores from the multiple choice section of the exam follow the link on Sakai for “results of machine scored exams.” There will be a final exam given, and it will be cumulative. 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 or other picture ID if asked may result in a zero on that exam. Test material to study: chapter reading outlines/homework, lecture activities, and power point slides. Therefore, to succeed in this class, it behooves you to take each reading/homework seriously and actively engage in all class discussions.

The Final Exam will take place on Monday, May 7th from 12:00-3:00 PM in GSB200.

SUPPLEMENTAL INSTRUCTION (SI) and PEER MENTORING:
ALL of the supplemental instructors and peer mentors were VERY successful students IN BIOL202 and are equipped with the knowledge and skills that you need to be successful in this course. The SI instructors will offer multiple sessions of supplemental instruction a week and will post problem sets for you on Sakai. They will also be in class helping you learn! In order for them to help you approach and analyze problems, you should bring problem sets and questions to them outside of class. Each session held by an SI instructor and peer mentor will be scheduled for 1 hour - the times and location of these sessions will be posted on Sakai during the first week of class. You are not required to attend either, but attendance is highly recommended, since this is your opportunity to get more help in this course. I suggest you fit SI into your schedule and attend weekly as if it is a required class. The contact information for the SI instructors and peer mentors is listed above. Check Sakai for times and locations.

What is the difference between SI and peer mentoring?
SI is going to look like a review session with a group of students in attendance each week. Peer mentors are offering more “one-on-one” help. If you are interested in reviewing the topics more broadly – attend SI. If you feel you need to sit down with someone and work with them one-on-one, see a peer mentor!

LEARNING CENTER:
http://learningcenter.unc.edu/
Need biology specific help? Make a tutoring appointment.
Want to talk about study strategies/time management or testing? Make an appointment with an academic coach.
PIAZZA:
There are many of you and your questions are important to us. However, it is often difficult for a single instructor with so many students to address all of the e-mails that are received throughout the course of the course. Unfortunately, as a result, sometimes your e-mails even fall to the bottom of our inboxes and go unanswered. Therefore, in order to address your questions and concerns more efficiently, we will be using an online platform called “Piazza” this course. You may post any questions that you have about the course to this site at any time and they will be answered by either a fellow student, a TA, or your instructor. Your questions may be more general and may relate to the course itself or they may be more specific and instead relate directly to content and/or material from class. In any case, Piazza will help you get them answered ASAP. You can sign up here: https://piazza.com/unc/spring2018/biol202006/

WHAT YOU SHOULD BRING TO CLASS EVERY DAY:
1. Outlines from Sakai (either printed or on laptop).
2. Extra blank paper for drawings, notes, activities etc. (or tablet computer for drawing)
3. 3 x 5 index cards (with or without lines, preferably white).
4. Learning Catalytics device: either your cell phone for texting or laptop/ipad/smartphone for responding

RECITATIONS:
During recitations, the TA will lead you through activities or problem-solving exercises. This course is a 4 credit hours course, and the recitations are a core component of the course. Some of the material covered in recitations will be supplemental to the material discussed in class. There will be no make-up opportunities for in-class assignments if you do not attend a recitation.

CLASS AND RECITATION ATTENDANCE:
Students are expected to attend and participate in class meetings and recitations. While the course follows the textbook, some of the material discussed in lecture may not be found in the text. You are responsible for all material and announcements made in lectures. You are not responsible for material that was not covered in class, unless it was specifically assigned (see detailed schedule for assigned readings).
**GRADING:**
The material taught in class meetings and recitations will be tested separately but the grades are combined for the final course grade. Your grade for this course will be determined as follows:

3 midterm exams = (18% each = 54%)
1 semi-cumulative final exam = (20%)
MasteringGenetics assignments = (10%)
Recitations = (10%)
Participation / Learning Catalytics = (6%)

Total: 100%

Letter grades will not be assigned for individual exams, only points; you will be able to see how you did from a posted distribution of scores after each test. Final grades will be assigned on the total number of points for the entire semester:
A 93-100; A- 90-92; B+ 87-89; B 83-86; B- 80-82; C+ 77-79; C 73-76; C- 70-72; D+ 66-69; D 60-65; F <60

A curve will be used only if the class grade average is <75. Exam questions will be taken from class meetings and assigned readings. Exams must be taken on the dates indicated; no makeup exams except in special circumstances, i.e. medical or family emergency documented in writing. Exams will be retained by the professor, but can be viewed by the student by appointment. **Requests for regrades must be submitted in writing within 1 week after exams are reviewed in recitation.**

*Note: there will be no changes to HOW your final average is calculated at the end of the course.*

Many students state that this is a “weed out” course. Of course this is not true, but why does it have this reputation? Fact: the average grade in Biol202 is in the B/C range; C’s are not bad - they are average. If you are wondering if there is a pre-determined number of students that receive a C, D, or F – the answer is no! In theory, if the whole class performs at an A level, then the whole class is given A’s.
DIGITAL ETIQUETTE:
This course will require you to use your laptop and/or cell phone during class time. While we recognize that you are an excellent multi-tasker, research suggest 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 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.

HONOR CODE:
All work done in this class must be carried out within the letter and spirit of the UNC Honor Code. You must sign a pledge on all graded work certifying that no unauthorized assistance has been given or received. You are expected to maintain the confidentiality of examinations by divulging no information about any examination to a student who has not yet taken that exam. You are also responsible for consulting with your professors if you are unclear about the meaning of plagiarism or about whether any particular act on your part constitutes plagiarism. Please talk with the professor if you have any questions about how the Honor Code pertains to this course.

UNC BIOLOGY DEPARTMENT DIVERSITY STATEMENT:
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.

COPYRIGHT POLICY:
All course materials including your class notes and in-class assignments are covered by University Copyright Policy, @http://www.unc.edu/campus/policies/copyright%20policy%202000008319.pdf. This means it is illegal and an honor code offense to share your notes or any other course materials, including Mastering Genetics items with anyone not directly affiliated with this particular class. No uploading to non-class sharing sites.

THE PROFESSORS RESERVE THE RIGHT TO MAKE CHANGES TO THE SYLLABUS, INCLUDING HOMEWORK DUE DATES. THESE CHANGES WILL BE ANNOUNCED AS EARLY AS POSSIBLE. TEST DATES will NOT change unless there is a university closing/emergency coinciding with the scheduled exam).
### CLASS SCHEDULE AND ASSIGNMENTS:

<table>
<thead>
<tr>
<th>Class#</th>
<th>Date</th>
<th>Do BEFORE class</th>
<th>Class Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td><em>(Exact readings are listed on the GRQs document; GRQs are generally NOT turned in but you may be asked to present them during class)</em></td>
<td><em>(See powerpoints for specific objectives)</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>(Bring class outline, printed, that corresponds to each lesson.)</em></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Thurs Jan 11</td>
<td>Guided Reading Question (GRQ) #1 Reading on Sakai: Process of Science Mastering Assignments (MA) #1 and “Introduction to Biol 202”</td>
<td>Welcome and survey Introduction to themes of genetic information and the process of science</td>
</tr>
<tr>
<td>2</td>
<td>Tues Jan 16</td>
<td>GRQs #2 Reading on Sakai: Lifestyle Changes May Lengthen Telomeres MA #2</td>
<td>How genetic information is organized in the genome</td>
</tr>
<tr>
<td>3</td>
<td>Thurs Jan 18</td>
<td>GRQs #3 and #4 Reading on Sakai: Overview of Information Flow and Dawning Era of Personalized Medicine MA #3 and #4</td>
<td>How genetic information flows from DNA to RNA to protein Variation in genetic information- from genotype to phenotype</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Recitation (1/16 and 1/17): Introduction and pre-test</strong></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Tues Jan 23</td>
<td>GRQs #5 and #6 MA #5 and #6</td>
<td>Process of Science: Discovery of the structure and function of DNA Process of science: Discovery of how DNA replicates</td>
</tr>
<tr>
<td>5</td>
<td>Thurs Jan 25</td>
<td>Open Ended (OE) HW #1 GRQs #7 MA #7</td>
<td>How genetic information is copied <em>in vivo</em> and <em>in vitro</em></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Recitation (1/23 and 1/24): BRCA case study</strong></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Tues Jan 30</td>
<td>GRQs #8 MA #8</td>
<td>How genetic variation arises by gene mutation (mutagens and mitosis)</td>
</tr>
<tr>
<td>7</td>
<td>Thurs Feb 1</td>
<td>MG Quiz 1 GRQs #9 MA #9</td>
<td>How genetic variation arises by recombination during meiosis</td>
</tr>
</tbody>
</table>
## Syllabus Biology 202 Spring 2018

### Recitation (1/30 and 1/31): PCR and DNA Fingerprinting

<table>
<thead>
<tr>
<th>8</th>
<th>Tues Feb 6</th>
<th>EXAM 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Thurs Feb 8 (Go UNCI!)</td>
<td>GRQs #10 Reading on Sakai: Problem with an Almost-Perfect World MA #10</td>
</tr>
</tbody>
</table>

### Recitation (2/6 and 2/7): TBD

<table>
<thead>
<tr>
<th>10</th>
<th>Tues Feb 13</th>
<th>GRQs #11 MA #11 and “Non-disjunction practice”</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Thurs Feb 15</td>
<td>GRQs# 12 MA#12</td>
</tr>
</tbody>
</table>

### Recitation (2/13 and 2/14): Go over Exam 1

<table>
<thead>
<tr>
<th>12</th>
<th>Tues Feb 20</th>
<th>GRQs #13 MA #13</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>Thurs Feb 22</td>
<td>GRQs #14 MA #14</td>
</tr>
</tbody>
</table>

### Recitation (2/20 and 2/21): Northern blotting

<table>
<thead>
<tr>
<th>14</th>
<th>Tues Feb 27</th>
<th>MG Quiz #2 GRQs #15 Reading on Sakai: Revisiting the Molecular Basis of Alleles and In a Single Gene MA #15</th>
</tr>
</thead>
</table>

### Recitation (3/6 and 3/7): Practice with the Lac Operon

<table>
<thead>
<tr>
<th>15</th>
<th>Thurs Mar 1</th>
<th>EXAM 2</th>
</tr>
</thead>
</table>

### Recitation (2/27 and 2/28): Review

<table>
<thead>
<tr>
<th>16</th>
<th>Tues Mar 6</th>
<th>GRQs #16 MA #16</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>Thurs Mar 8</td>
<td>GRQs #17 MA #17</td>
</tr>
</tbody>
</table>

### Recitation (3/6 and 3/7): Practice with the Lac Operon
<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Assignment</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>Tues Mar 20</td>
<td>GRQs #18</td>
<td>Regulating the flow of information in eukaryotes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MA# 18 and “More lac operon practice”</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Thurs Mar 22</td>
<td>No assignment</td>
<td>Regulating the flow of information in eukaryotes</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Recitation (3/20 and 3/21): Regulation of prokaryotic gene expression</strong></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>Tues Mar 27</td>
<td>No assignment</td>
<td>Epigenome: Ghost in our Genes</td>
</tr>
<tr>
<td>21</td>
<td>Thurs Mar 29</td>
<td>GRQs #21</td>
<td>Transmission of information from one species to another: Recombinant DNA Technology I</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MA #21 and “Recombinant DNA Technology”</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Recitation (3/27 and 3/28): APC Gene Expression Activity</strong></td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>Tues Apr 3</td>
<td>EXAM 3</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>Thurs Apr 5</td>
<td>GRQs #22</td>
<td>Recombinant DNA Technology II</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Videos: Engineer a Crop; CRISPR</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reading on Sakai: Truth about Genetically Modified Foods; CRISPR and GMOs; CRISPR and Sickle Cell Disease</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MA #22</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Recitation (4/3 and 4/4): Epigenetics or GMOs</strong></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Tues Apr 10</td>
<td>GRQs #23</td>
<td>Transmission of independently assorting traits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reading on Sakai: Growing Menace of Superweeds</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MA #23</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Thurs Apr 12</td>
<td>GRQs #24</td>
<td>Pedigrees and human disease</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reading on Sakai: Couples Cull Embryos to Halt Heritage of Cancer</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MA #24</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Recitation (4/10 and 4/11): Go over Exam 3</strong></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>Tues Apr 17</td>
<td>GRQs #25</td>
<td>Modifications of Mendelian ratios: single gene traits</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MA #25</td>
<td></td>
</tr>
<tr>
<td>27</td>
<td>Thurs Apr 19</td>
<td>GRQs #26</td>
<td>Gene interactions and Complementation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MA #26</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tues Apr 24</td>
<td>MG Quiz #3</td>
<td>Transmission of linked traits</td>
</tr>
<tr>
<td>-----</td>
<td>-------------</td>
<td>------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td></td>
<td></td>
<td>GRQs #27</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>MA#27</td>
<td></td>
</tr>
<tr>
<td>29</td>
<td>Thurs Apr 26</td>
<td>Catch-up and Review</td>
<td></td>
</tr>
</tbody>
</table>


| Mon May 7 12-3 pm | CUMULATIVE FINAL EXAM (Weighted towards 4<sup>th</sup> part of class) |