Biology 240: General Genetics

Semester: Spring 2018

Time & Location: T, R 11:10AM - 12:25PM, 309 WLS

Instructor: Dr. Michael Gilchrist (a.k.a. Dr. G)

Office Hours: W 11:00AM-12:00PM, R 12:30-1:30PM, and by appointment.

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Email: Dr.G@utk.edu

Teaching Assistants:

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Overview

We are currently in the midst of a revolution in the depth and detail of our understanding of biology. This revolution has been driven primarily by technological advances in experimental and computational tools and their application to genetics. The study of genetics is now an important part of *all* areas of biology. Furthermore, because humans are and rely on other biological entities, genetics plays a role in many important social, economic, and environmental issues.

The major aim of this course is to give you a basic background and understanding of genetics from the molecular to the evolutionary scale. This course will expose students to some of the core concepts in modern genetics. The course will emphasize both specific details (i.e. facts you need to memorize) and broader concepts (i.e. ideas you need to understand based on the facts you've memorized). In the end, students should be well prepared for future study in biology and to function as informed members of our society.

Course Objectives

The objective of this course is for students to gain basic understanding and expertise in the five following topics

1. The transmission of genes at a single locus and their evolution in response to mutation, natural selection, and genetic drift.
2. Transmission of genes at multiple loci, their interactions, and their mapping.
3. Molecular structure and replication of DNA.
4. Gene expression & its regulation.
5. Molecular aspects of mutation and genome structure.

More specific objectives will be given at the start of most lectures. The above topics can be related to the **Biology Degree Learning Objectives** as follows

Evolution: Populations of organisms and their cellular components have changed over time through both selective and non-selective evolutionary processes. (Related Topics Include: 1, 3, 5)

Structure and Function: All living systems (organisms, ecosystems, etc.) are made of structural components whose arrangement determines the function of the systems. (1, 3, 4)

Information Flow and Storage: Information (DNA, for example) and signals are used and exchanged within and among organisms to direct their functioning. (1, 2, 3, 4)

Transformations of Energy and Matter: All living things acquire, use, and release and cycle matter and energy for cellular/organismal functioning. (Related Topics Include: 1, 3, 5)

Systems: Living systems are interconnected, and they interact and influence each other on multiple levels. (1, 4)

Course Expectations

Students are expected to master the materials presented in lecture, recitation, and assignments to the point at which they can analyze, integrate, and synthesize information related to the field of genetics. In order to reach this goal it is crucial that students (a) read the the assigned material *before* lecture and recitation, (b) attend lecture and recitation sessions, (c) do the assigned homework and activities, and (d) seek help when needed. As always, students are expected to adhere to the University's Academic Honor Statement (`http://dos.utk.edu/hilltopics`) and should refer to it as needed.

Student Diversity

Dr. G, the Division of Biology, and the College of Arts and Sciences recognizes and values diversity. Exposing students to diverse people, ideas and cultures increases opportunities for intellectual inquiry, encourages critical thinking, and enhances communication and information competence. When all viewpoints are heard, thoughtfully considered, and respectfully responded to, everyone benefits. As a result, students are expected to be respectful and supportive of one another. Vol means *all*.

Course Materials

Required

- Klug *et al.* (2015) Concepts in Genetics 11th ed. Pearson.[1]
- Access to MasteringGenetics[1]
- A scientific calculator
- Turning Technologies 'clicker'.

A hard copy of the textbook is available on reserve in Hodges Library. A large amount of additional content such as tutorials, activities, and quizzes to test your understanding of each chapter are available using an access code at the textbook's website: `masteringgenetics.com`.

Note that for the the material presented in class will *not* always follow the order of the chapters of the book. This is sometimes distressing for students, but the goal is to help provide students a better conceptual framework for learning the material. In addition to lectures, class activities will be used periodically. Lecture slides will generally be posted the evening before each class.

[1] Provided via course's Inclusive Access fee.

Unacceptable

Cellphones, laptops, and tablets must be kept away during all aspects of the course. Students violating these rules during will be asked to leave lecture immediately. (This is embarrassing for the student and makes Dr. G look like a jerk, so please don't do violate this rule.) Students violating these rules during exams will receive a 0 for the exam and be referred to the Office of Student Conduct and Community Standards.

Online Discussion Board

Student questions related to course materials and structure *should not* be emailed their TAs or Professor since any answer given is potentially relevant to the entire class. Instead, questions related to the course materials and structure should be posted to the course's Discussion Board so that other students can benefit from the question as well. If you have a question about the course or material covered in the course and you can't figure it out based on the textbook or lecture slides, the Discussion Board should be one of the first places you go to get help.

We will be using Piazza's Discussion Board, which is catered to getting you help fast and efficiently from classmates, the TAs, and Dr. G. Piazza's Discussion Board features include anonymous posting (to everyone or just other students), post tagging, wiki like editing of answers, and instructor approval of answers.

A couple notes about the Discussion Board (DB)

- Questions and answers should be clearly written.
- Questions should also posted with an informative subject line such as "Is a meiocyte haploid or diploid?" rather than "Question".
- While the forums will be monitored by Dr. G and the TAs, students are strongly encouraged to respond to their peers' questions. Students often understand and can address questions from their peers more efficiently and effectively than the instructors.
- The DB also allows you to control who sees your posting so, for example, if you only want to post to your team or you can do so.
- Students have a tendency to not want to improve the 'Student's Answer' if someone else has started it, but you are strongly encourage you to do so. This is a much more effective approach than simply posting your additions or corrections of the 'Student's Answer' as a follow up.
- Although you can access the Piazza DB via Canvas, because it is hosted by a third party if you're a new Piazza user you'll be asked to create a password when you first log in. This allows you login to Piazza's website directly, rather than having to go through Canvas.

Student Assessment

Team Performance

Student Teams

Students will be put together in teams of 4-6 students. Teams will be formed using an evidence based method provided at the CATME.org website. As a result, students will be required to fill out a survey questionnaire by 5pm on Thursday January 20th. Students failing to do so may be *dropped* from the course.

The major goal of forming teams is to encourage student interactions and facilitate student learning. It has been repeatedly shown that students learn best when they work with their peers. These teams will also work together on homework, recitation activities, and the team part of the exams (see below). Teammates are encouraged to sit together during lecture so they can become more familiar with each other, improve their abililty to work together, and collaborate during in-class quizzes. Several times during the semester, students will also be required to provide peer evaluations of their teammates using CATME as well.

Peer Evaluations

In order to ensure fair grading of student involvement during team activities, online peer evaluations will be used 5 times during the course; once before the first exam, to help students become familar with the technology, and then after each exam. In order to ensure effective peer evaluations, students are required to complete CATME's evaluation training activity before they can fill out the first evaluation. Students can earn between 0 and 105% credit for a given peer evaluation depending on their peers' assessment of their contribution to the team. Students who fail to properly complete an evaluation will receive a 0 for that evaluation, so don't miss any peer evaluations!

Additional points regarding peer evaluations

- Students will be emailed an invitation in my name from CATME.org with a link to their individual peer evaluation form. This means you shouldn't use another teammates's CATME link.
- In order to ensure the integrity of the peer evaluation process, the following rules must be observed by all students. Failure to follow these rules constitutes a form of *academic dishonesty* and will violation of the University's Honor Statement and will be dealt with accordingly.
  - Students may not discuss how they score one another with each other. Doing so undermines the ability of your peers to give anonymous feedback.
  - Discuss or develop an agreed upon strategy or plan for providing feedback. Doing so undermines the purpose of the evaluations which is to accurately assess the contribution of team members to the project.
- Out of a sense of fairness, students are often inclined to give all of their peers the same score even if that does not accurately reflect the contribution level of each individual. While well intended, this behavior is actually unfair since it rewards students who make more of a contribution the same as students who make less of a contribution.
- Equal contribution does not necessarily mean all students need to contribute to the project the same way. Teams are encouraged to leverage their individual members strengths in order to maximize team member learning.
- Peer scoring should be based solely on the contribution to team work during the period under consideration. If you feel you were 'too generous' in a previous evaluation, you cannot 'even things out' by inappropriately lowering your evaluation score in a later one.
- Students often do not like formally evaluating one another. Students should note that the instructor wishes he didn't have to formally evaluate students either, but recognizes that it is an integral component of student learning.
- Students often feel that they are not able to accurately evaluate their peers. Students should realize that all evaluation is error prone, so the best one can do is make a genuine effort to evaluate one another honestly and fairly. In addition, because students are part of the team, they are in the best position to evaluate their teammates.
- Claiming to have contributed to an activity you did not contribute to constitutes an act of academic dishonesty. Academic dishonesty is a serious violation of UTK's Student Code of Conduct as described in the latest *Hilltopics Student Handbook*.

One last important note, in the unlikely scenario where you *don't* work with your team in any meaningful manner (i.e. you skip team meetings, don't help with activities or homework), it is impossible for you to accurately evaluate their performance. As a result, you should refrain form filling out the team evaluation. Filling out the form under these circumstances is a violation of the student conduct code since you effectively are making false claims about your teammates. Remember, a 0 for a team evaluation is better than failing

the course. Again, this only applies to the rare student that does not collaborate with his or her team. Your mean peer evaluation score, which can, again, range from 0 to 105%, will be used to scale your combined team performance score, which constitutes to 35% of your course grade. See the section **Points Allocation and Grade Assignment** below for more details.

Recitation Sessions

There are 14 recitation meetings during the semester and most meetings will involve team activites which are turned in the following week. Attendance to all meetings is expected and recorded. Due to the interactive nature of the recitations, students cannot make up missed sessions. Material covered by the activities will also be covered in the homework and on the exams. Recitation attendance will account for 5% of your Team Performance. Recitation activities will account for 15% of your Team Performance.

Homework

The purpose of the homework is to help you master the skills, knowledge, and understanding required in the course. There are eight scheduled homework assignments. Homework assignments due dates are listed in the Course Schedule below. Assignments will be posted at least one week before their due date. Your lowest *completed* homework score will be dropped.

Because students often learn best from each other, homeworks are to be done as a team assignment. Teams are strongly discouraged divide up the questions amongst themselves and then simply combining these efforts. First, because it is a team assignment the team is responsible for the entire content. Thus, even if only one of the students knowingly plagiarizes or cheats, it is the same as if the entire team did so. Second, such a strategy defeats the purpose of the assignment. It results in students being ill prepared for exams and future work and wasting the TA's time grading. Instead of working in isolation, students are expect to work together so that each question turned in reflects the combined effort of the team.

Solutions to most of even numbered the end of the chapter questions can be found in Appendix A of the textbook. The solutions to *all* of the end of the chapter questions are available in the Solutions Manual, "Student Handbook and Solutions Manual for Klug's *Concepts of Genetics*, 11e", which can be purchased by students and is on reserve in the library. For other homework questions a key is usually posted within 48 of the assignment being posted.

While teams may consult the Solutions Manual or other teams to help them understand homework problems, the work they turn in should reflect them solving the problem on their own. That is, you can get help from where ever you'd like, say the Solutions Manual, but what you turn in should be what you did on your own without using any reference directly. Copying an answer from the Solutions Manual or another student's homework is cheating and will not be tolerated. Using the Solutions Manual or talking with another student to learn how to solve a problem and then sitting down and solving the problem yourself is not cheating. Similarly, using the Solutions Manuals or comparing your work with a fellow student's to check your solution, learning you've made a mistake, and then correcting that mistake on your own is not cheating. If done correctly this is actually an effective way to learn. Homework will account for 30% of your Team Performance.

Individual Performance

Pre-Lecture Quizzes

The evening before each lecture, a short quiz will be posted on the MasteringGenetics website. Quizzes are open book and students have until 2 hours before the start of class to complete the quiz. Students may retake the same quiz multiple times before the deadline. Only the score from the last time you took it will count. No make up quizzes will be given; however, your lowest three scores will be droped. Pre-Lecture Quizzes will account for 12% of your Individual Performance.

Clicker Questions

Clickers will be used during most lectures. Clickers can be purchased in the UT Bookstore and must be registered online. See http://oit.utk.edu/wp-content/uploads/Registering_UsingClickers.pdf for instructions. Students who have used their clicker in previous courses do not need to re-register their clickers unless their license has expired. Students will receive full credit for correct answers and 1/4 credit for incorrect answers. Any student caught using multiple clickers (i.e. their own and someone elses) will automatically *fail* the course. Clicker scores will scaled so that the class average is at least 75%. Due to the large size of this course, it is not possible to 'make up' missed clicker questions or activities. Only under extreme circumstances, such as a student being hospitalized for more than one week, will accommodations be made. In all other cases, students are encouraged to complete the extra credit Lifeline Essay described below. Clicker Questions will account for 14% of your Individual Performance.

Exams

Three midterm and one final exam will be given. The goal of the exams is to evaluate student mastery of the materials covered in lecture, homework, recitation, and the assigned readings. Midterm exams may cover older material, but their main emphasis will be on the subset of lecture topics indicated in the course schedule.

All exams will be multiple choice. Questions are often adapted with little or no modification from homework assignments, clicker quizzes, recitation activities, or previous exams, which will be available on Canvas. Each midterm exam will be administered in two parts. In the first part, students will have ∼50 minutes to take the exam individually. In the second part, students will have ∼20 minutes to take the exam in their team. The final exam is comprehensive, but a substantial portion of the questions will be focused on the last subset of lectures. The final exam will also be administered in two parts, ∼80 minutes for the individual part and ∼40 minutes for the team part. Individual exam weights can be found below, but, in summary, exams account for 50% of your Team Performance and 66% of your Individual Performance.

In the past, students have found the exams in this course to be very challenging, this is part of their purpose. Students should be aware, however, that if the mean class score of an exam is less than 77%, student scores will be curved by rescaling student scores such that the mean score is 77%. For example, if the mean is 72%, then each score will be multiplied by $77/72 = 1.069$. If the mean score is greater than 77% no curve will applied and instead Dr. G will go have a beer to celebrate. Make up exams will be given only under *extraordinary* circumstances and documentation will be required. Make up exams are expected to be taken as soon as feasible.

While substantial effort is made to ensure the exams have no mistakes or errors and the questions are clearly written, problems do occur. In general, the key for each exam will be posted same day the exam was taken. If students believe they have found an error or a reasonable misinterpretation of a question they can petition to have the question thrown out or additional answers be accepted as correct by posting on the Discussion Board. Petitions must be posted within 24 hours of the key being posted in order to minimize any disruption or delay in grading of the exam.

'Lifeline' Essays

Students have an opportunity to earn up to 0.75% extra credit in the course by writing a two page essay based on a genetics focused research seminar hosted by an academic unit on campus. Relevant units include, but are not limited to, the Departments of BCMB; Microbiology; EEB; Entomology & Plant Pathology; Forestry, Wildlife, & Fisheries as well as the National Institute of Mathematical and Biological Synthesis. The key requirement is that the central focus of the seminar must be on some aspect of genetics. By looking at the seminar title and abstract it is up to the student, not the professor (so please don't ask), to initially assess whether a given seminar meets this key requirement. Write ups are due a week after the seminar. More details about the write up and requirements as well as links to each seminar series can be found on Canvas.

Points Allocation and Grade Assignment

A student's grades is determined by their performance in three main categories: Individual Performance, Team Performance, and Team Peer Evaluations. Student performance will be evaluated using the table below. When discussing your grade with Dr. G or TAs, please use the *Performance Level* definition. For example, students should say "I want to perform at an outstanding level in this course" rather than "I need to get an A in this course". Additionally, students are responsible for ensuring that they receive appropriate credit for their work. Any errors in grading or grade entry should be brought to Dr. G's attention within two weeks of its posting on Canvas or return of the assignment, which ever is later.

	Grade Weights	
Category	Within Category	Course Total
Team Performance		35%
Homework	30%	
Recitation Activities	20%	
Exam I	10%	
Exam II	12%	
Exam III	12%	
Final Exam	16%	
Total	100%	
Individual Performance		65%
Pre-Lecture Quizzes	12%	
Clicker Questions	14%	
Recitation Attendance	8%	
Exam I	14%	
Exam II	16%	
Exam III	16%	
Final Exam	20%	
Total	100%	
	Total	100%

Point Range	Performance Level	Grade
100-93%	Outstanding	A
90-93%	Excellent	A-
87-90%	Very Good	B+
83-87%	Good	B
80-83%	Reasonable	B-
77-80%	Fair	C+
73-77%	Satisfactory	C
70-73%	Unsatisfactory	C-
67-70%	Poor	D+
63-67%	Very Poor	D
60-63%	Extremely Poor	D-
<60%	Failure	F

A student's course performance will be calculated using the formula,

$$\text{Student Performance} = 0.65 \times \text{Individual} + 0.35 \times \text{Team} \times \text{Peer Evaluation Score}$$

where the Peer Evaluation Score is the average score, from 0 to 1.05, of a student's peer evaluations.

Succeeding in BIOL240

Genetics is one of the fastest moving, integrative, and exciting areas of biology. During the semester the course will cover topics range from molecular to the macroscopic scale, from processes that occur in fractions of a second to billions of years. Our descriptions of these processes will be both verbal and mathematical and we will often use statistics to evaluate whether or not data is consistent with a given hypothesis. As a result, genetics is one of the most challenging biology courses for undergraduate students. In order to succeed in this course students must take an active role in getting help when they need it.

As mentioned previously, students are expected to do all assigned reading before class. Doing so ensures students are adequately prepared to understand the lecture material and actively engage in any discussion. In addition, students are strongly encouraged to print out the lecture slides before coming to class and use these print outs for taking notes. Black and white printing is available at multiple locations on campus for a very low cost, $0.03/page (see https://oit.utk.edu/labs/printing/ for more details.). To further reduce printing costs, students often print 2 or 4 lecture slides on a single page and print double sided.

It is important to realize that different students learn in different ways. Often times an explanation in lecture or the textbook that may be clear to one student may be opaque to another. As a result students are encouraged to ask Dr. G questions during lecture and discuss the material with each other outside of class. Students are also encouraged to look beyond the textbook and lecture notes for additional information. Students are cautioned to make sure they evaluate the quality and reliability of source of information they utilize. A list of suggested online resources are listed at the Canvas site. Students are encouraged to post additional links they find useful on the Discussion Board. The Discussion Board is a great place for students to get help and help one another.

Another place to get help is from Dr. G or TA who hold scheduled office hours specifically to help answer student questions about course materials and students are *strongly* encouraged to utilize them. If you can't make those, you can email them to make an appointment.

Additionally, the University has a Student Success Center (SSC) that is dedicated to providing all students with both academic and personal support. Amongst their many services, the SSC provides help with studying techniques, exam strategies, and *free* tutoring. Please visit http://studentsuccess.utk.edu/support/ for more information on the services provide by the SSC. The Office of Multicultural Student Life also provides *free* open tutoring sessions twice a week and on going personal tutoring services. These tutoring services are open to *all* UTK students. For more information go to http://multicultural.utk.edu/as_home.php.

If you find that you are having difficulty in the course, don't wait for things to get worse! Take action! Get help by posing questions on the Discussion Boards, going to office hours, attending a tutoring session! Your fellow students are probably some of your best learning resources. You are strongly encouraged to help one another, especially your teammates, study, solve homework problems, and discuss the materials covered in this course.

Finally, while students often find this course very challenging, the ones who rise to the challenge find it helps them in their later studies. Below is a email from a former student attesting to this fact.

> Dr. Gilchrist,
>
> I am one of your Biology 240 students from a few years ago at UT. I am currently in medical school at UTHSC in Memphis and going through some genetics lectures. I just wanted to let you know how well your class prepared me for this level of study. I am so much better off compared to most of my classmates, and while in a lot of my classes I have to study rigorously to learn the material, the genetics comes so easily to me. Thanks to the background I learned in your class, basically I just "get it" and love it more and more every day. It has even made me want to practice a specialty that will incorporate genetics. Even when I studied for the MCAT, I never had to review genetics thanks to Bio 240, whereas most pre-med students end up teaching themselves how to read a pedigree a month before the test. I literally breezed through every question and pedigree and still do, and I feel like that is a testament to your class! I was a BCMB major, and I can only think of 2 classes that have directly made medical school easier for me, so thank you! I really appreciate it!

Miscellanea

- The syllabus is subject to change at Dr. G's discretion. Updated versions will be posted on Canvas.
- In order to foster interactions between Dr. G and students, photos of each student with their name will be taken during the second recitation. The Professor and TAs will use these photos to aid in memorizing student names. If for some reason you have an objection to having your photo taken, please contact Dr. G.
- In terms of hours of study students should expect to spend on this course, the University's Undergraduate Catalog states,

  > One semester credit hour represents an amount of instruction that reasonably approximates both 50 minutes per week of classroom-based direct instruction and a minimum of two hours per week of student work outside the classroom over a fall or spring semester.

  This means a full course load of 15 credit hours corresponds to a *minimum* of

  $$3 \text{ h/(credit-hour week)} \times 15 \text{ credit-hour} = 45 \text{ h/week}$$

  of class and study. BIOL240 is a 4 credit hour course; as a result, students should expect to spend a *minimum* of 8 or more hours/week *outside* of the classroom studying or working on course material.
- Canvas Announcements will be the main means of alerting student to course activities and changes. Students are expected to check these on a frequent basis.
- When emailing Dr. G, please (a) ensure that the term BIOL240 is included at the start of the subject line or else it will likely not be read and (b) include an appropriate salutation and complementary closing or it will likely be ignored. "Dear Dr. Gilchrist", "Professor Gilchrist", or even "Hello Dr. G." is acceptable, but "Hey", "Yo Dude", or nothing at all is inappropriate. Again, email is appropriate for questions or issues specific to an individual student. Emails will generally be responded to within 36h during the week and within 72h during the weekend.
- Students wishing to add the course should contact Dr. Randy Brewton (*rbrewton@utk.edu*).
- **Disability Statement:** If you need special course adaptations or accommodations because of a documented disability, please contact the Office of Disability Services at 974-6087 to ensure that you get the necessary resources.

Research

Students often inquire about the type of research I do when I'm not teaching. I will try to touch on my research when relevant to the course's material, but briefly I am interested in testing hypotheses about how DNA and proteins evolve using models that integrate our biological understanding from the molecular to the organismal to the species scale. More specifically, I study how molecular sequences evolve over time and the co-evolution of hosts and pathogens. My research draws on areas of biology, mathematics, statistics, and computer programming. A number of students from BIOL240 have joined my laboratory over the years. Students working in my lab generally have some training in two or more of these areas and, more importantly, enthusiasm to learn about the others.

BIOL240 General Genetics Spring 2018 Schedule

Date	Day	Lecture	Topics	Assigned Readings	Discussion
11	Jan R	1	Course Structure; Genome Overview I	Ch 1	No Meeting
16	Jan T	2	Genome Overview II; Cell Division	Ch 12; Ch 2.0-2.3	Understanding the Binomial Distribution
18	Jan R	3	Cell Division II; Sex, Gametes, & Life Cycles; Mendel & His Peas	Ch 2.4-2.7; Ch 7	
19	Jan F[1]		*Homework 1 on Lectures 1-3 Posted*		
23	Jan T	4	Mendelian & Non-Mendelian Genetics	Ch 3.0-3.2, 3.7, Ch 4.0-4.2 & 4.10-4.13	Reading & Interpreting Pedigrees
25	Jan R	5	Non-Mendelian Inheritance II	Ch 9	
26	Jan F		*Homework 1 Due at 4:30pm in 402 Hesler*		
31	Jan T	6	Mutation, Protein Function, & Allele Categories; Dominance I	Ch 4.3-4.6, 15.0-15.2 & 15.5	Chi Square Test
01	Feb R	7	Dominance II; Nature of Science; Pop. Gen., HWE, & Inbreeding	Ch 25.0-25.3, 25.8 & Supplementary Readings	
02	Feb F		*Homework 2 on Lectures 4-7 Posted.*		
06	Feb T	8	Mutation & Its Role in Evolution	Ch 15.0-15.5, 15.8	Introduction to Cystic Fibrosis (CF)
08	Feb R	9	Natural Selection; Genetic Drift	Ch 25.4-25.5 & Supplementary Readings	
09	Feb F		*Homework 2 Due at 4:30pm in 402 Hesler*		
13	Feb T		**Exam I: Emphasis on Genome Overview – Inbreeding**		CF Risks & Classifications
15	Feb R	10	Combining Mutation, Selection, & Drift to Explain Genome Structure	Supplementary Readings	
16	Feb F		*Homework 3 on Lectures 7-10 Posted.*		
20	Feb T	11	Mendelian Genetics & Independent Assortment	Ch 3.3-3.4	LOD Activity
22	Feb R	12	Mapping Genes via Crosses	Ch 5.0-5.5	
23	Feb F		*Homework 3 Due at 4:30pm in 402 Hesler*		
27	Feb T	13	Linking Maps to Sequences; Bacterial Genetics I	Ch 5.6-5.10, Ch 6.0-6.4	Mapping the CF Gene
01	Mar R	14	Bacterial Genetics II	Ch 6.5-6.9	
02	Mar F		*Homework 4 on Lectures11-13 Posted*		
06	Mar T	15	Bacterial Genetics III; Gene Interactions I	Ch 4.7-4.10	Advances in Understanding Genetic Disorders
08	Mar R	16	Gene Interactions II; DNA Structure I	Ch 10	
09	Mar F		*Homework 4 Due at 4:30pm in 402 Hesler; Homework 5 on 12-15 Posted (sorry)*		
13	Mar T		Spring Break		
15	Mar R		Spring Break		
20	Mar T	17	DNA Structure II; DNA Replication	Ch 11	Pathway Deduction in Neurospora
22	Mar R	18	DNA Replication II; RNA & Transcription	Ch 13.0-13.10	
23	Mar F		*Homework 5 Due at 4:30pm in 402 Hesler*		
27	Mar T		**Exam II: Emphasis on Pop. Gen. – Bacterial Genetics III**		Classic Studies in Molecular Biology: Avery et
29	Mar R	19	Transcription II; Translation I	Ch 13.11-13.14; Ch 14.0-14.5	
30	Mar F		*Spring Recess: Homework 6 on Topics 15-18 Posted Day Before*		
03	Apr T[2]	20	Translation II	Ch 14.6-14.12	CRISPR Reading
05	Apr R	21	Translation III; Bacterial Gene Regulation I	Ch 17.7, Ch 16.0-16.5	
06	Apr F		*Homework 6 Due at 4:30pm in 402 Hesler & Homework 7 on 18-21 Posted.*		
10	Apr T	22	Bacterial Gene Regulation II	Ch 16.6-16.7	Transcription and Translation of CF
12	Apr R	23	Bacterial Gene Regulation III; Eukaryotic Gene Regulation	Ch 17.0-17.6	
13	Apr F		*Homework 7 Due at 4:30pm in 402 Hesler*		
17	Apr T		**Exam III: Emphasis on Gene Interactions – Translation III**		Recombinant DNA Techniques applied to CF
19	Apr R	24	Eukaryotic Gene Regulation II	Ch 17.7-17.8, Special Topic 1: Epigenetics	
20	Apr F		*Homework 8 on Topics 22-24 Posted.*		
24	Apr T	25	Eukaryotic Gene Regulation III; Mutation at the Molecular Level	Ch 15.0-15.5	Cancer Case Study
26	Apr R	26	Mutation, Cancer, & Evolution	Ch 19.0-19.4	
27	Apr F		*Homework 8 Due at 4:30pm in 402 Hesler; Practice Problems for Lectures 24-26 Posted*		
04	May F		**Final Exam: Cumulative but Emphasis on Gene Regulation - Cancer 10:15AM-12:15PM 307 SERF**		

1 Last day to change grading options or drop without a "W"

2 Last day to withdraw from course.

version: 01/11/18