

# Principles of Genetics

## Biology 3060

## Spring 2021

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**Classes:** MTW, 9:30 – 10:20 via Zoom

**Office Hours:** M & R 1:30 – 2:30 and by appointment (all meetings via Zoom)

**Required Materials:** Pierce, B. A., *Genetics – A Conceptual Approach, 7th ed* (2020) W.H. Freeman  
iClicker Reef subscription

**Objectives:** Provide content knowledge of major areas of genetics.  
Strengthen problem-solving skills.  
Develop teamwork skills for tackling scientific problems.  
Highlight the link between genetics and society.

**Points:**

Weekly online reading quizzes	15%
Class participation	15%
Peer and personal evaluations	1%
Group problem sets	20%
Two hourly exams*	15% each
Comprehensive final exam	19%

\*There will be 3 hourly exams, but only the top 2 scores will count toward your grade.

**Overview of the Course:** This web broadcast course mixes recorded lectures, weekly readings and reading quizzes, and work in class meetings held via Zoom.

Before getting into details, let me say that this is a new way for me to teach Principles of Genetics. The plan I have for how to run this course during the Covid-19 pandemic is described here, but I won't be afraid to make adjustments to improve the course as we gain experience throughout the semester.

**Recorded lectures:** Lectures will be recorded for each week's block of material and posted on Canvas. I will aim to have all lectures ready at the beginning of each week, but only promise to have all the lecture recordings available by the end of each week.

**Zoom-based class meetings:** We'll meet via Zoom on Monday, Tuesday, and Wednesday of each week at the scheduled class time of 9:30 – 10:20 am. The plan is to work on genetics problems on Mondays and Wednesdays in small groups via Zoom meeting rooms. Tuesdays will be devoted to working on exam-style questions with guidance from the instructor and for you to ask questions you have about the material. The details of scheduling which days are devoted to genetics problem solving and exam-style questions may be adjusted to optimize your learning of genetics. Attendance of these Zoom meetings is required and will constitute 10% of your course score. I also understand that things can come up that prevent you from attending every meeting, so you're allowed to miss 4 meetings (out of 42 meetings) without penalty. Attendance will be recorded through your response to clicker questions, so you must have a properly registered iClicker Reef account (see more details on iClicker Reef below).

**Assigned readings and reading quizzes:** Readings and reading quizzes are another important way of learning genetics. These readings will provide you with background information to facilitate work on genetics problems and to reinforce concepts that I'll assess in exams. Realize that reading quizzes assess your understanding of the assigned readings; there's no need to have all lecture material recordings posted before you complete a reading quiz. Reading quizzes will be taken through Canvas and due at 9 am on Mondays. **Late submissions** will be accepted up to 24 hours after the deadline with a 20% point reduction. Submissions past 24 hours after the deadline will not be accepted. Working with your team on reading quizzes is fine as long as everyone on the team discusses and understands each of the questions. Although work within your team is allowed, I consider it a violation of the Student Honor Code—and will report the violation—if answers are posted for the class to use. Work in reasonable-sized teams and keep your answers within the team if you chose to work a part of a group. Full instructions for quizzes will be available well before the first quiz is due. You

**Genetics problem sets:** You will be assigned to a group that remains the same throughout the semester for teamwork on genetics problems. You'll work with your team two days each week during class sessions in Zoom breakout rooms. The instructor and at least one of the UTFs will be available during these sessions to answer your questions. The purpose of this work is to give you experience solving genetics problems and to leverage the power of teamwork to increase your ability to solve these problems. I know some students dislike group work and that some groups are more cohesive than others. I'm relying on the research literature to support the idea that the overall benefit of working as part of a team outweighs any costs. Your team will submit one set of genetics problems per group every other week of the semester.

Each problem set will be submitted through Canvas and be due at 6 pm on the dates posted in the syllabus. There will be a 10% point reduction if the problem set is submitted late **but within 24 hours** after the due date. Beyond this time, submissions will **not be accepted**.

**Peer and Personal Evaluations:** You will evaluate the performance of your teammates and yourself in group work twice during the semester. This will be done with a standard set of questions that focus on each individual's contribution to the team effort. The purpose of these evaluations is to assess who's pulling their weight and your own contribution to the team effort. Points will be awarded solely on the basis of a good-faith effort at completing the evaluations, but actions may be taken based on evaluation results.

**Exams:** There will be three hourly exams and a comprehensive final exam. Only the top 2 hourly exam scores will count toward your course score. This means you can miss one hourly exam for any reason. You must take the final exam. Exam questions will be mostly multiple-choice questions with an occasional true/false question. You'll get practice on these types of questions once a week in our class meetings. Practice exams for hourly exams will be available. Exams will be administered in Canvas and proctored via Proctorio. To use Proctorio, you'll need a computer with a web cam and microphone. Full instructions for those of you unfamiliar with Proctorio will be provided well ahead of the first exam.

### **Course Materials:**

**Auto Access eText:** We'll use an Auto Access system for purchasing the required text. This will allow you to obtain a subscription to the current edition eText as a discount from the publisher's price. Inclusive Access allows you to opt out of the system. Before doing this, carefully consider if this will be to your benefit. Given the reliance on assigned readings, you must have a text. Here's a description that's required by the Provost of all courses using Inclusive Access:

This course requires all-inclusive digital materials that are provided to you at a lower price than traditional printed materials. These materials are paid for through an "Auto Access Digital Materials" charge placed on your student account when you registered for the course. **To access the materials, visit the Canvas course site and click on the Bookshelf link.** For more details, including dates, deadlines, and opt-out info, visit your student Auto Access Portal: <https://portal.verba.io/usu/login> (<https://portal.verba.io/usu/login>)

**iClicker Reef:** You'll need to purchase a subscription to this remote polling system that allows you to use a mobile device, tablet, or laptop as an iClicker. You can subscribe to iClicker Reef at <https://www.iclicker.com/pricing#student-pricing> (<https://www.iclicker.com/pricing#student-pricing>), with a 6-month subscription costing \$15.99. We'll use this system every class meeting and it will be essential for obtaining participation points. I will not accept your word that you were at a class session and will only use your clicker response as a metric. Please follow the registration instructions carefully, paying close attention to proper entry of your A number. Also be sure to check that you're receiving iClicker points early in the semester and get in touch with me if there are problems. Dealing with iClicker registration issues at the opening of the semester is relatively easy, but dealing with these same issues late in the semester can be painful or impossible.

**Grading:** The most stringent possible grading scale is shown at right. Points *may* be added at the instructor's discretion to exams, clicker scores, or the reading quiz scores.

Grade	Percentage	Grade	Percentage
A	93.33 -100%	C	73.33% - < 76.67%
A-	90% - < 93.33%	C-	70% - < 73.33%
B+	86.67% - < 90%	D+	66.67 % - < 70%
B	83.33% - < 86.66%	D	60% - < 66.67 %
B-	80% - < 83.33%	F	< 60%
C+	76.67% - < 80%		

**Course Policies:**

- You must attend class sessions (via Zoom) and actively participate in your group
- The group stands or falls together – be sure to have a clear line of communication about who is submitting a problem set and the quality of the submission.
- Deadlines for exams, quizzes and problem set submissions are firm.
- You must have a properly registered iClicker Reef account and a functional mobile device and WiFi connection in each class to obtain participation points
- Individual extra credit activities are not available.
- Grading of exam questions or problem sets is open for discussion up to 48 hours after scores are returned to the class, but not beyond this time.
- If you contest grading of problem sets, work first with the UTF to see if the issue can be resolved, and see me only after working with the UTF.

Everyone knows that problems can occur, especially in the middle of a pandemic. I'm reasonable and will be happy to discuss unforeseen events with you and possibly make adjustments if warranted, but there must be a well-justified reason for making any exceptions to the course policies.

**Office Hours and Meeting with the Instructor:** Feel free to use Zoom to visit during regular office hours.

**Advice:** Realize that you're going to need to spend a lot of time on this course and that you must keep up with readings and problem sets. Be careful to avoid the trap of having your teammates do the problem solving for you. You can easily get a great score on the problem sets, but things won't go well on exams if you lean on others to do your work.

**General USU Policies**

**Withdrawal Policy, Incomplete Grades, and Dropping Courses:** If a student does not attend a class during the first week of the term or by the second class meeting, whichever comes first, the instructor may submit a request to have the student dropped from the course. (This does not remove responsibility from the student to drop courses which they do not plan to attend.) Students who are dropped from courses will be notified by the Registrar's Office through their preferred e-mail account.

Students may drop courses without notation on the permanent record through the first 20 percent of the class. If a student drops a course following the first 20 percent of the class, a W will be permanently affixed to the student's record (check General Catalog ([https://catalog.usu.edu/misc/catalog\\_list.php?catoid=12](https://catalog.usu.edu/misc/catalog_list.php?catoid=12)) for exact dates).

Students with extenuating circumstances should refer to the policy regarding Complete Withdrawal from the University and the Incomplete (I) Grade policy in the General Catalog.

**Critical Deadlines:** Deadlines for adding and dropping the course with various notations on your transcript and for changing to P/D+/D/F are all given in the spring Registration Calendar at: <https://catalog.usu.edu/content.php?catoid=12&navoid=21080> (<https://catalog.usu.edu/content.php?catoid=12&navoid=21080>) If you find yourself wondering about any of these options, please check the posted dates carefully.

Academic Integrity - "The Honor System": The University expects that students and faculty alike maintain the highest standards of academic honesty. The Code of Policies and Procedures for Students at Utah State University (Student Conduct (<https://studentconduct.usu.edu/studentcode>)) addresses academic integrity and honesty and notes the following:

Students have a responsibility to promote academic integrity at the University by not participating in or facilitating others' participation in any act of academic dishonesty and by reporting all violations or suspected violations of the Academic Integrity Standard to their instructors.

To enhance the learning environment at Utah State University and to develop student academic integrity, each student agrees to the following Honor Pledge: "I pledge, on my honor, to conduct myself with the foremost level of academic integrity". Violations of the Academic Integrity Standard (academic violations) include, but are not limited to cheating, falsification, and plagiarism

Plagiarism includes knowingly "representing by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgment. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials." The penalties for plagiarism are severe. They include warning or reprimand, grade adjustment, probation, suspension, expulsion, withholding of transcripts, denial or revocation of degrees, and referral to psychological counseling.

**Students with Disabilities:** USU welcomes students with disabilities. If you have, or suspect you may have, a physical, mental health, or learning disability that may require accommodations in this course, please contact the Disability Resource Center (DRC) as early in the semester as possible (University Inn # 101, 435-797-2444, [drc@usu.edu](mailto:drc@usu.edu) (<mailto:drc@usu.edu>)). All disability related accommodations must be approved by the DRC. Once approved, the DRC will coordinate with faculty to provide accommodations.

**Mental Health:** Mental health is critically important for the success of USU students. As a student, you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance or reduce your ability to participate in daily activities. Utah State University provides free services for students to assist them with addressing these and other concerns. You can learn more about the broad range of confidential mental health services available on campus at Counseling and Psychological Services (CAPS) (<https://counseling.usu.edu/>).

Students are also encouraged to download the "SafeUT App" (<https://healthcare.utah.edu/uni/programs/safe-ut-smartphone-app>) to their smartphones. The SafeUT application is a 24/7 statewide crisis text and tip service that provides real-time crisis intervention to students through texting and a confidential tip program that can help anyone with emotional crises, bullying, relationship problems, mental health, or suicide related issues.

<b>Principles of Genetics (Biol 3060) Spring 2021 Schedule</b>						
<b>Date</b>	<b>Zoom Meeting</b>	<b>Weekly Topics<sup>1</sup></b>	<b>Chapter<sup>2</sup></b>	<b>Reading Quizzes<sup>3</sup></b>	<b>Problem Sets<sup>4</sup></b>	<b>Exams<sup>5</sup></b>
1/19		Introduction; Chromosomes & Cellular Reproduction	1 & 2			
1/20		Basic Principles of Heredity (a)	3			

1/25	1	M	<b>Basic Principles of Heredity (b)</b>	3			
1/26	2	T	<b>Sex Determination &amp; Sex-Linked Characteristics</b>	4			
1/27	3	W					
2/1	4	M	Extensions & Modifications of Basic Principles	5	<b>RQ 1</b>		
2/2	5	T					
2/3	6	W					
		R				<b>PS 1</b>	
2/8	7	M	Pedigree Analysis	6	<b>RQ 2</b>		<b>Exam 1</b>
2/9	8	T	Linkage, Recombination, & Eukaryotic Gene Mapping (a)	7			<b>Exam 1</b>
2/10	9	W					
2/15		M	<b>President's Day!</b>	7			
2/16	10	T	Linkage, Recombination, & Eukaryotic Gene Mapping (b)		<b>RQ 3</b>		<b>Eval.1</b>
2/17	11	W	Chromosome Variation	8			
2/18		R				<b>PS 2</b>	
2/22	12	M	Quantitative Genetics	24	<b>RQ 4</b>		
2/23	13	T					
2/24	14	W					
3/1	15	M	Population Genetics	25	<b>RQ 5</b>		
3/2	16	T					
3/3	17	W					
3/4		R				<b>PS 3</b>	
3/8	18	M	DNA: The Chemical Nature of the Gene	10	<b>RQ 6</b>		<b>Exam 2</b>
3/9	19	T	Chromosome Structure & Organelle DNA	11			<b>Exam 2</b>
3/10	20	W					
3/15	21	M	DNA Replication & Recombination	12	<b>RQ 7</b>		
3/16	22	T					
3/17	23	W					
3/18		R				<b>PS 4</b>	
3/22	24	M	Transcription	13	<b>RQ 8</b>		
3/23	25	T	RNA Molecules & RNA Processing	14			

3/24	26	W					
3/29	27	M	Genetic Code & Translation	15	<b>RQ 9</b>		<b>Exam 3</b>
3/30	28	T					<b>Exam 3</b>
3/31	29	W					
4/1		R				<b>PS 5</b>	
4/5	30	M	Control of Gene Expression in Bacteria	16	<b>RQ 10</b>		
4/6	31	T	Control of Gene Expression in Eukaryotes (a)	17			
4/7	32	W					
4/12	33	M	Control of Gene Expression in Eukaryotes (b)	17	<b>RQ 11</b>		
4/13	34	T	Epigenetics	21			
4/14	35	W					
4/15		R				<b>PS 6</b>	<b>Eval. 2</b>
4/19	36	M	Molecular Genetic Analysis	19	<b>RQ 12</b>		
4/20	37	T					
4/21	38	W					
4/26	39	M	Genomics & Proteomics	20	<b>RQ 13</b>		
4/27	40	T					
5/3		M					<b>Final</b>
5/4		T					<b>Final</b>

1. Weekly topics indicate the recorded lecture and reading schedule. All lecture material will be available no later than Thursday of each week. Parts (a) and (b) of some chapters indicate that the content of these chapters will be split between two weeks.

2. You'll given a list in Canvas of detailed readings from each of these chapter by Monday afternoon of the week they're assigned (i.e., one week before the quiz is due).

3. All reading quizzes (with the exception of President's Day) are due at 9 am on Mondays.

4. Group problem sets are due every other week at 6 pm on Thursdays beginning on the 3<sup>rd</sup> Thursday of the semester.

5. In addition to the posted exam schedule, you'll complete two evaluations of contributions to group work made by you and your team members. Each evaluation is due at 6 pm on the posted dates.