01:447:380:01-15;H1;H2 GENETICS
Course Syllabus – Fall 2023

LECTURE INSTRUCTOR
Doreen Glodowski, Ph.D. glodowski@dls.rutgers.edu

RECITATION INSTRUCTORS
Shawn Sorrels shawn.sorrels@rutgers.edu
Ava Medberry ava.medberry@rutgers.edu
Laura Byron leb143@scarletmail.rutgers.edu
Dylan Sullivan ds1437@dls.rutgers.edu
Seanna Kelly sek155@rutgers.edu

COURSE WEBSITE
https://canvas.rutgers.edu/

OFFICE HOURS
In-person (B426 Nelson Labs on Busch Campus): Mon & Wed at 1 – 2pm
On Zoom (see log-in info on Canvas): Thurs at 2:30 – 3:30pm

Office hours will begin during Week 2 (9/11 – 9/15). Come to office hours to discuss any material covered in class or on a lecture video, to go over a question in an OH or recitation assignment, to discuss study strategies for exams, to discuss anything related to the field of genetics (current events, research, etc), or just to say hi. Meetings are informal and optional. No appointment is needed. You may show up/log on at any time during the hours listed and stay as long as you'd like. Meetings can also be arranged at other times, by request.

COURSE DESCRIPTION
Genetics 380 is a 4-credit course designed to teach students basic concepts of Genetics. Each week, new material is introduced in lecture videos posted on Canvas. Understanding of this material is demonstrated by completing questions embedded in lecture videos, completing online homework assignments (via the Achieve site), working through recitation assignments in class, answering clicker questions during TWIG meetings, and completing 3 exams.

This course has a hybrid format consisting of both synchronous (in-person) and asynchronous (online) components. Recitation and TWIG meetings are synchronous and will be held in-person. Regular attendance at these meetings is expected and will help you review lecture material and prepare for exams. Lectures and Online Homework (OH) assignments are asynchronous. See each weekly module on Canvas for links to corresponding lecture videos and OH assignments.

The table below summarizes work that will be completed during a typical week. Each activity is described in more detail in other sections of this syllabus. Suggested readings from the text are listed on the lecture schedule and should be done as needed to supplement info provided in lecture videos.

Weekly Activities	When is it available?	When is it due?	Where is it posted?	How many points is it worth?
Lecture videos with questions embedded (**2 lectures per week, during most weeks**)	Saturdays at 7am	**Fridays by 11:59pm**	Canvas	**2 points per lecture**
Online Homework (**2 assignments per week, during most weeks**)	Saturdays at 7am	**Fridays by 11:59pm**	Achieve site (see links posted in Canvas)	**2 points per assignment**
Recitation Assignment (**1 per week**)	During your recitation	**During your recitation**	Canvas	**5 points**
TWIG meeting **(1 per week)**	Mon (for Group A) or Tues (for Group B)	**At the end of class**	Clicker questions are asked during class meeting	**4 points**

COURSE MEETING INFO

Each week, you will meet twice for in-person classes. You will earn points at these meetings for attendance and participation.

1. **One 80-minute TWIG (This Week In Genetics) meeting**
   Mon at 10:20 – 11:40am in AB-4225 for Sections 01 – 08; H1. This is Group A.
   Tues at 12:10 – 1:30pm in AB-4225 for Sections 09 – 15; H2. This is Group B.
   Note that you only attend one TWIG meeting each week. The day/time of your meeting depends upon your section number.
2. **One 50-minute Recitation meeting**
   The day/time of your recitation depends upon your section number.

See the chart below for a list of sections, meeting days/times for both TWIG and Recitation, and the name of the instructor for each recitation. TWIG meetings are taught by Dr. Glodowski.

Recitation meetings begin during the first week of the semester. TWIG meetings begin during the second week of the semester. Therefore, Group B will not meet for TWIG on Tues Sept 5, but all recitation meetings on Sept 5 – 8 will meet. The first TWIGs happen on 9/11 (Group A) and 9/12 (Group B).

Section	**Meeting Schedule**	**Recitation Instructor**
01	**TWIG (Group A):** Mon 10:20 – 11:40am in AB-4225 **Recitation Mtg:** Tues 8:45 – 9:40am in AB-1150B	Ava Medberry
02	**TWIG (Group A):** Mon 10:20 – 11:40am in AB-4225 **Recitation Mtg:** Tues 10:35 – 11:30am in AB-1150A	Laura Byron

03	**TWIG (Group A):** Mon 10:20 – 11:40am in AB-4225 **Recitation Mtg:** Wed 8:45 – 9:40am in AB-1150A	Seanna Kelly
04	**TWIG (Group A):** Mon 10:20 – 11:40am in AB-4225 **Recitation Mtg:** Thurs 8:45 – 9:40am in AB-1150A	Ava Medberry
05	**TWIG (Group A):** Mon 10:20 – 11:40am in AB-4225 **Recitation Mtg:** Thurs 10:35 – 11:30am in AB-1150A	Laura Byron
06	**TWIG (Group A):** Mon 10:20 – 11:40am in AB-4225 **Recitation Mtg:** Fri 8:45 – 9:40am in AB-1150A	Seanna Kelly
07	**TWIG (Group A):** Mon 10:20 – 11:40am in AB-4225 **Recitation Mtg:** Fri 10:35 – 11:30am in AB-1150A	Laura Byron
08	**TWIG (Group A):** Mon 10:20 – 11:40am in AB-4225 **Recitation Mtg:** Tues 10:35 – 11:30am in AB-1150B	Ava Medberry
09	**TWIG (Group B):** Tues 12:10 – 1:30pm in AB-4225 **Recitation Mtg:** Wed 8:45 – 9:40am in AB-1150B	Shawn Sorrels
10	**TWIG (Group B):** Tues 12:10 – 1:30pm in AB-4225 **Recitation Mtg:** Thurs 8:45 – 9:40am in AB-1150B	Shawn Sorrels
11	**TWIG (Group B):** Tues 12:10 – 1:30pm in AB-4225 **Recitation Mtg:** Fri 8:45 – 9:40am in AB-1150B	Dylan Sullivan
12	**TWIG (Group B):** Tues 12:10 – 1:30pm in AB-4225 **Recitation Mtg:** Fri 10:35 – 11:30am in AB-1150B	Dylan Sullivan
13	**TWIG (Group B):** Tues 12:10 – 1:30pm in AB-4225 **Recitation Mtg:** Thurs 2:15 – 3:10pm in AB-4450	Dylan Sullivan
14	**TWIG (Group B):** Tues 12:10 – 1:30pm in AB-4225 **Recitation Mtg:** Wed 7:45 – 8:40pm in AB-4400	Shawn Sorrels
15	**TWIG (Group B):** Tues 12:10 – 1:30pm in AB-4225 **Recitation Mtg:** Thurs 7:45 – 8:40pm in AB-4450	Seanna Kelly
H1	**TWIG (Group A):** Mon 10:20 – 11:40am in AB-4225 **Recitation Mtg:** Wed 10:35 – 11:30am in AB-1150B	Dr. Glodowski
H2	**TWIG (Group B):** Tues 12:10 – 1:30pm in AB-4225 **Recitation Mtg:** Thurs 10:35 – 11:30am in AB-1150B	Dr. Glodowski

REQUIRED COURSE MATERIAL

Access to Achieve Learning Site

This site contains all online homework assignments, the e-version of the required text, Genetics: A Conceptual Approach 7th edition by BA Pierce ISBN: 1-319-21680-3, AND information needed for iClicker use. Please note that it is **not necessary** to purchase a hard copy of the textbook because the textbook is included with purchase of access to the Achieve Learning Site.

Achieve is provided through the First Day program with the university bookstore. With First Day, the publisher agrees to sell site access at a discounted rate, which is lower than the regular retail price. That charge is added to your term bill, so you're still able to use financial aid to pay for the course materials. You do have the ability to opt out of the First Day program. However, doing so will mean you are responsible for obtaining Achieve access for Pierce's *Genetics: A Conceptual Approach, 7e* on your own, and this will cost more. If you decide to drop the course, you will not be billed for access to Achieve.

You will access Achieve (which includes the eBook, required Online Homework assignments and information for iClicker registration) through our Canvas site. You will have access as soon as the term begins, allowing you to get started with the eBook in Achieve right away. Use the following steps to log onto Achieve for the first time:

1. On the Genetics 380 course Canvas site, click the "Modules" tab listed on the left.
2. In the "Getting Started" module, click "Student Registration – Start Here"
3. Enter your first name, last name and email address associated with Canvas. Note that the email address entered here MUST MATCH the email address you use on Canvas.
4. You are now enrolled in the course on Achieve.

MORE DETAILS:
https://macmillan.force.com/macmillanlearning/s/article/Students-Register-for-Achieve-courses-via-your-school-s-LMS

Student Support:
https://macmillan.force.com/macmillanlearning/s/chat-with-us

To begin using iClicker, follow instructions listed here:
https://macmillan.force.com/iclicker/s/article/Student-Guide-iClicker-Roster-Grade-Sync-Integration
Note that your access to the iClicker program is included with Achieve for this course, so you do not need to enter/purchase any additional access code. If you are using iClicker in other courses as well, you may need to purchase a subscription for those other courses.

TECHNOLOGY REQUIREMENTS

High-speed internet access
Device with camera and microphone

Please visit the Rutgers Student Tech Guide page for resources available to all students. If you do not have the appropriate technology for financial reasons, please email Dean of Students deanofstudents@echo.rutgers.edu for assistance. If you are facing other financial hardships, please visit the Office of Financial Aid at https://financialaid.rutgers.edu/.

For tech help with Canvas, please visit https://it.rutgers.edu/help-support.

LEARNING GOALS

1. Students will be able to describe Mendel's Two Laws and show how they relate to the process of meiosis by diagramming chromosome positions during various steps of meiosis. Students will also be able to describe phenotypic and genotypic effects on an organism if meiosis does not happen as normal.

2. Students will be able to describe experiments and interpret theoretical results that led to conclusions fundamental to the field of Genetics, including work done by Hershey & Chase, Meselson & Stahl, Taylor and others.

3. Students will be able to solve basic Genetics problems involving various modes of inheritance as well as both continuous and discontinuous traits.

4. Students will be able to analyze pedigree diagrams and distinguish between simple and complex modes of inheritance.

5. Students will be able to diagram the process of gene expression (including transcription and translation), identifying and describing the functions of essential proteins. Students will also be able to compare and contrast gene expression and its regulation in prokaryotes and eukaryotes.

6. Students will be able to list, describe, compare and contrast the functional implications of several different types of DNA mutations as well as different cellular repair mechanisms.

7. Students will be able to describe the general methods of and applications for various biotechnology techniques, including recombinant DNA technology, DNA sequencing, microarray analysis, CRISPR-Cas and others.

8. Students will be familiar with basic concepts in the areas of population genetics and quantitative genetics. In addition, students will be able to solve basic problems dealing with population and quantitative genetics.

GRADING

Final grades will be assigned based on a points system. Points are earned throughout the semester by completing OH assignments, by completing recitation assignments, by viewing lecture videos and completing embedded questions, by attending and participating in TWIG meetings, and by completing exams. Total points available are shown in the table below.

Category (# of assignments)	Points available
Lecture Videos (26)	50 (25 lectures x 2 points each; lowest score is dropped)
Online Homework (26)	50 (25 assignments x 2 points each; lowest score is dropped)
TWIG meetings (11)	40 (10 meetings x 4 points each; lowest score is dropped)
Recitation Assignments (13)	60 (12 assignments x 5 points each; lowest score is dropped)
Exam 1	100
Exam 2	100
Final Exam	100
Total:	**500**

The chart below shows how final letter grades will correspond to total points earned.

Letter Grade	Point Ranges
A	450 – 500
B+	425 – 449
B	400 – 424
C+	375 – 399
C	325 – 374
D	250 – 324
F	0 – 249

LECTURE VIDEOS

Lecture videos will be posted on the course Canvas site. Each lecture may be divided into multiple parts to make viewing easier. For example, Lecture 2 material is divided into 2 videos: Lecture 2 Part 1 and Lecture 2 Part 2. You earn points by correctly answering questions embedded within lecture videos (0.5 points per question; 2 points total per lecture).

Lectures for each week will be released on Canvas on Saturday mornings (7am). For a list of lecture video topics and relevant readings from the text, see "Schedule for Lecture Videos" posted in the "Course Essentials" module on Canvas. To earn points, lectures must be viewed, and questions answered by midnight on the following Friday. **Late submissions are not accepted**. The lowest lecture score will be dropped before final grades are calculated.

ONLINE HOMEWORK

Online Homework (OH) assignments are completed on the Achieve Learning site. Completing OH assignments is required to pass this course. One OH assignment corresponds to each lecture. For most weeks, there will be two OH assignments due. Every Saturday morning, assignments will be available on the Achieve Learning site. These assignments are due before midnight on the following Friday night. Due dates for all OH assignments are listed in "Schedule for Recitation & Online Homework", posted on Canvas in the "Course Essentials" module.

The Achieve Learning site is interactive. Each time you answer a question, you will know immediately if your answer is correct. **You may submit answers multiple times without penalty**. You may view optional hints and there is often an explanation that can be viewed with each correct answer. You will not be penalized for initially choosing incorrect answers.

As you work through an assignment, Achieve keeps track of your progress on the left side of the screen. When you submit the correct answer to a question, you earn a score of 100 for that question. If you choose to give up and view the solution to a question, you earn a score of 0 for that question. Achieve uses the scores on each question in an assignment to calculate a final % for that assignment. **In order to earn full credit for an assignment, you must complete the entire assignment AND you must earn 80% or above on that assignment.**

Credit will only be given for OH assignments that are completed by the designated due date and time with a score of at least 80%. No partial credit will be given if an assignment is started but has not been completed. **To complete an assignment, you must either submit a correct answer OR choose to view the correct answer FOR EVERY QUESTION in the assignment.**

Your work on the Achieve Learning site is automatically saved, so problems need not be completed all at once or in any specific order. However, you must ultimately complete all problems in an assignment by the due date and time and earn a score of at least 80% to earn credit for your work. Partial credit for OH assignments will not be given.

All problems in an assignment can be viewed after the due date has passed. Reviewing OH assignments is a great way to prepare for exams. Each OH assignment is worth 2 points. Grades for work completed in Achieve will flow directly into the Canvas gradebook daily (usually within a few hours of completion). Final scores of 80% - 99% will be adjusted to 100% (2 points) manually after the due date of the assignment passes. Likewise, final scores below 80% will be manually adjusted to 0% (0 points).

RECITATION ASSIGNMENTS

Recitations will be held during the first week of this semester. During each recitation class, you will spend part of the time working in a small group to complete an assignment posted on Canvas. Your TA will circulate around the room, answering questions and generating discussion. After you submit your assignment on Canvas, your TA will discuss answers and problem-solving strategies. If time allows, you may also cover additional practice problems.

Recitation assignments cover material from the current week's lectures. For example, during Week 1, Lecture 1 is released on Canvas, so material from Lecture 1 is covered in the recitation assignment. To prepare for recitation each week, it is strongly suggested that you view lecture videos beforehand.

Recitation assignments will be available to you on Canvas during your recitation period. Once you open an assignment, you will have 20 minutes to complete it. Assignments are graded. Full credit will only be possible if you are present for the entire recitation period, complete your assignment in class and participate in discussion.

If you must miss class for a religious observance, please inform your TA in advance. If possible, arrangements will be made for you to attend a different recitation session that week.

There are 13 recitation meetings on the schedule. Your lowest score is dropped before final grades are calculated. Therefore, you may miss one recitation for any reason, and it will not affect your final grade. If you must miss class, please inform your TA within 24 hours of your missed class. If it is your first absence, you will earn a 0 for the assignment, but no makeup is needed because this grade will be dropped. If you are absent two or more times, you must contact me to discuss your situation. Makeups may be arranged, depending upon the situation, at my discretion.

TWIG MEETINGS

TWIG meetings provide an opportunity for you to test your understanding of material covered in lecture videos, recitation and OH assignments during the previous week. TWIG meetings will not follow a traditional lecture format. Rather, you will use the iClicker system to respond to questions posed in class. I will use class performance to identify topics that require further discussion. In this way, I hope to address any confusion remaining after you have worked through the previous week's material.

TWIG meetings will begin during Week 2 of the semester. The first TWIG meeting will cover material from Lecture 1 (presented during Week 1). There are 11 TWIG meetings on the schedule. Your lowest score is dropped before final grades are calculated. Therefore, you may miss one TWIG for any reason, and it will not affect your final grade. If you must miss class and it is your first absence, no makeup is needed. If you are absent multiple times, you must inform me within 24 hours of your missed class. A makeup assignment may be arranged, depending upon the situation, at my discretion.

Attendance and participation in each TWIG is worth 4 points. To earn the 4 points, you must be present for the entire class period and respond to at least 75% of the questions asked. There is no penalty for incorrect answers during TWIG sessions, since credit is awarded strictly for participation. However, there is no partial credit given, so if you are present and respond to less than 75% of the questions asked, you will earn a 0 for that day.

A NOTE ABOUT COURSE ORGANIZATION

Current research on learning and memory indicates that students retain information best when they are actively engaged in the process of learning. Also, spaced study, where students are challenged to recall concepts and practice applying new knowledge in several sessions over a period of time, is much more effective than a single marathon study session held shortly before an exam.

Genetics 380 has been designed to provide you with opportunities to engage in active learning and to develop spaced study habits. New material will first be presented to you in an online lecture. During each lecture, you must pause to answer a couple of questions (active learning). You will then complete an online homework assignment based on material from the lecture. This is more active learning and it is the second time you are being asked to recall material from the lecture. Here, there is no penalty for making mistakes. You may try each question multiple times and full credit is given when the assignment is completed with a score of at least 80%. The third time that you must recall material from the lecture is during your recitation session. Here, you will complete a graded in-class assignment. You are encouraged to work with other students and you may use any study materials you'd like, but the assignment is timed, so it is important for you to know where to look for relevant information. The fourth time that you must recall material from lecture is during your TWIG session.

Here, you will answer clicker questions and discuss your answers with others in class. Points are earned for attendance and participation. iClicker questions are not graded, so you are encouraged to try your best and learn from your mistakes. Thus, over a one-week time period, you are spacing your learning of lecture material over at least four sessions: watching lecture video, completing OH, attending a recitation session and attending a TWIG.

By studying in this way each week, preparation for each exam should be more efficient and your understanding of course material should persist even after this semester ends. Maintaining a schedule of spaced learning is not easy, but studies show that this method will help you learn better and remember longer. A few references on this subject are listed at the end of the syllabus.

EXAM POLICIES

There will be three exams in this course. Each exam will be 1 hour and 20 minutes in duration. Exams 1 and 2 will be held during TWIG meetings on Week 7 and Week 11, respectively. Therefore, Group A will take exams on Mondays and Group B will take exams on Tuesdays. The final exam, which is NOT CUMULATIVE, will be held on the dates designated by the Rutgers final exam schedule. Exam dates and times are listed below as well as on the lecture schedule posted on the course Canvas site.

Exams will be in-person. Makeup exams will be scheduled at my discretion. If a makeup exam is requested, I must be notified within 12 hours of the scheduled exam period.

Exam	Date	Time	Material Covered
1	Group A: Mon Oct 16 Group B: Tues Oct 17	10:20 – 11:40am 12:10 – 1:30pm	Lectures 1 – 9
2	Group A: Mon Nov 13 Group B: Tues Nov 14	10:20 – 11:40am 12:10 – 1:30pm	Lectures 10 – 17
3 (Final)	Group A: TBD Group B: TBD	TBD TBD	Lectures 18 – 26

ADDITIONAL RESOURCES

There are many helpful resources available on the Achieve Learning Site, including animations, problem solving videos and interactive tutorials. Viewing and completing these resources is optional. However, if you find it difficult to visualize a particular concept or work through one type of problem, these resources may be useful.

To access the Achieve course site, use the link “Achieve” under the heading “Online Homework Through Achieve Site” in the “Course Essentials” module on Canvas. Optional resources on Achieve are grouped based on the content of weekly lecture material. Scroll through the site to any given week and you will find a list of optional resources relevant to material covered during that week.

Suggested readings from the text corresponding to each lecture are listed on the lecture schedule. These readings are strongly suggested as a supplement to information provided in lecture videos. You may access the complete textbook on Achieve from the toolbar on the left. In addition, each weekly folder on Achieve contains links to sections of the text relevant for that week’s course material.

LETTERS OF RECOMMENDATION

Each semester, many students request a letter of recommendation for applications to medical school, dental school, summer internships, etc. I will only write a letter for you if I feel that I am able to write a strong letter that will enhance your application. At minimum, the following criteria must be met before I will consider writing a letter: 1. You must earn an A in Genetics 380; 2. You must regularly attend and participate in TWIG Meetings and recitations. In addition, I will have a better opportunity to get to know you if you are able to do one or more of the following: i) regularly attend and participate in office hours, ii) post questions, answers and/or comments in the forums on Canvas, iii) send me email regularly with questions and/or comments on course material.

ACADEMIC INTEGRITY

Students are expected to maintain the highest level of academic integrity. You should be familiar with the university policy on academic integrity. Violations will be reported and enforced according to this policy.

Use of external website resources such as Chegg.com or others to obtain solutions to homework assignments, quizzes, or exams is cheating and a violation of the University Academic Integrity policy. Cheating in the course may result in grade penalties, disciplinary sanctions or educational sanctions. Posting homework assignments, or exams, to external sites without the instructor's permission may be a violation of copyright and may constitute the facilitation of dishonesty, which may result in the same penalties as plain cheating.

Almost all original work is the intellectual property of its authors. These works may include syllabi, lecture slides, recorded lectures, homework problems, exams, and other materials, in either printed or electronic form. The authors may hold copyrights in these works, which are protected by U.S. statutes. Copying this work or posting it online without the permission of the author may violate the author's rights. More importantly, these works are the product of the author's efforts; respect for these efforts and for the author's intellectual property rights is an important value that members of the university community take seriously.

For more instructions on copyright protections at Rutgers University, please refer to the Rutgers Libraries.

STUDENT-WELLNESS SERVICES

Counseling, ADAP & Psychiatric Services (CAPS)
(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901/ http://health.rutgers.edu/medical-counseling-services/counseling/
CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professionals within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community, and consultation and collaboration with campus partners.

Crisis Intervention : http://health.rutgers.edu/medical-counseling-services/counseling/crisis-intervention/

Report a Concern: http://health.rutgers.edu/do-something-to-help/

Violence Prevention & Victim Assistance (VPVA)
848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901 / www.vpva.rutgers.edu/
The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

Disability Services

(**848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / https://ods.rutgers.edu/**

Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: https://ods.rutgers.edu/students/documentation-guidelines. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: https://ods.rutgers.edu/students/registration-form.

A FEW REFERENCES ON LEARNING

G. Xue, L. Mei, C. Chen. Z. Lu, R. Poldrack, and Q. Dong (2011), Spaced learning enhances subsequent recognition memory by reducing neural repetition suppression, Journal of Cognitive Neuroscience 23(7): 1624-1633.

P. C. Brown, H. L. Roediger III, and M. A. McDaniel (2014), Make It Stick: The Science of Successful Learning.

M. D. Miller (2014), Minds Online: Teaching Effectively with Technology.