

## BIOL 223: Genetics Laboratory Syllabus - Fall 2021, Thursday 9 & 1:30

**Course description** (from student bulletin): Selected experiments designed to demonstrate the principles of genetics and to introduce a range of genetics techniques and model systems. Pre- or co-requisites: introductory chemistry and genetics (BIOL 222).

**Instructor:** Josie Reinhardt: [geneseo.zoom.us/j/2611825805](https://geneseo.zoom.us/j/2611825805), [reinhardt@geneseo.edu](mailto:reinhardt@geneseo.edu)

**Office Hours:** Tuesday 2:30-4:00 (on zoom), Wednesday 1:00-2:30 (ISC 306 or on zoom)

### Lab Materials:

Laboratories will be posted on Canvas a week prior to each lab. Students should purchase a dedicated notebook and folder for this course, or 3-ring binder with loose leaf paper. Students are encouraged to print each lab and bring it to class with them. Students will also need to have access to the textbook we use in the Genetics Lecture/BIOL222 (Genetics Analysis and Principles by Robert Brooker) as background for several labs - if you do not have it let us know. Students should bring their notebook, calculator, pencil, and sharpie every day, along with their laptop, laboratory coat, and UV safe lab goggles as indicated in the schedule (spare coats and goggles are available!).

### Course goals:

- (1) Students will learn about experimental design of genetic studies
- (2) Students will learn to collect, analyze, and interpret data
- (3) Students will learn to communicate scientific results in written and oral form
- (4) Students will gain experience with a variety of laboratory skills and model organisms

### Flow of the class:

While conducting experiments by actually handling liquids and working with organisms does comprise a goodly amount of the time that is spent in the lab, we will also be spending time thinking through the rationale for the experiments, analyzing and interpreting our data, as well as explaining science to others. In general the labs in this course do not have an outcome that can be determined or predicted *a priori*. Instead, you will learn how to determine *from the data you generate* what biological model is best supported. This makes sense as we are working together not only to ensure you can master techniques, but also to prepare you for future technical and research work in which this sort of thinking and communication is essential.

Before you leave each day, you will work with your lab partner(s) to organize for the following weeks' lab. This is best done by drawing a flow-chart and notating who will be doing what for the next weeks' experimental procedures. You should also figure out with your lab partner(s) the purpose of each step. Doing this is the absolute best way to prepare yourself for the **pre-lab quizzes** which we will do the start of lab (except for the first week). You're also likely to get done with lab earlier! You will turn in **answers to lab questions** and/or **lab reports** and a **final presentation**. If you're confused about experimental procedures or about the results from previous labs, please come to office hours or get in touch via email! I'd love to see you!

Date	Lab activities	Equipment	Assignments
Week 1: 9/2	Introduction, Safety, working with Bacteria	Lab coat	N/A
Week 2: 9/9	Transformation of <i>E. coli</i> with plasmid DNA	Lab coat UV goggles	Prequiz 1 Questions: Lab safety and handling Bacteria
Week 3: 9/16	Inheritance of Mendelian and complex traits (week 1)	Lab coat	Prequiz 2 Questions: Transformation of <i>E. coli</i>
Week 4: 9/23	Analysis of natural genetic variation by PCR (week 1)		Prequiz 3 Questions: Mendelian and complex traits – Pt 1
Week 5: 9/30	Analysis of natural genetic variation by PCR (week 2)		Prequiz 4 <b>PLANTS!</b>
Week 6: 10/7	Inheritance of Mendelian and complex traits (week 2)		Prequiz 5 Questions: Analysis of natural genetic variation
Week 7: 10/14	RT-PCR for viral screening (week 1)	Lab coat	Prequiz 6 Questions: Mendelian and complex trait – Pt 2
Week 8: 10/21	R T-PCR for viral screening (week 2)	Lab coat	Prequiz 7 Full report 1: Mendelian and complex traits
Week 9: 10/28	Bacterial Conjugation and mapping	Lab coat	Prequiz 8 Questions: Viral Screening
Week 10: 11/4	Gene expression in response to the environment	Lab coat	Prequiz 9 Questions: Bacterial mapping
Week 11: 11/11	Mutation of antibiotic resistance (week 1)	Lab coat	Prequiz 10 Questions: Gene expression Full report 2: Bacterial mapping
Week 12: 11/18	Mutation of antibiotic resistance (wk2)	Lab coat	Prequiz 11
Week 13: 11/25	THANKSGIVING NO CLASS!!!!		<b>SUBMIT RANKED CHOICES FOR PRESENTATIONS</b>
Week 14: 12/2	Mutation of antibiotic resistance (week 3)	Lab coat	Prequiz 12
Week 15: 12/9	FiNAL PRESENTATIONS		FiNAL PRESENTATIONS Questions: Mutation Lab

**Questions:** Due at lab start each week. **Prequiz:** Taken at start of lab (~10 min)

**Reports:** You will divide up report writing with your group and submit your portions of reports individually on Canvas by **TUESDAY**. By the start of lab, you must integrate your portions into a complete report. Half of your grade on each report will be individual, half will be group.

**COVID safety:**

- If you have any symptoms or are otherwise sick **DO NOT COME TO LAB**. Be in communication with me and your lab partner(s) about making up material. If you begin feeling ill during class please let me know and leave promptly.
- Whether or not you are vaccinated, you are required to wear a mask over your nose and mouth at all times when indoors on campus except when eating and drinking. If you don't have a mask, there are masks dispensers around the ISC.
- Observe social distancing when possible. With current seating requirements, you will likely be within <6ft of your lab partner(s) and myself at various points, but should be able to stay distanced from other lab groups.
- As part of lab procedures, you will cleanse your bench area and tools you use with a disinfectant spray / paper towels when you come into lab and when you leave. Microscope eye pieces should be cleaned gently before and after use with alcohol wipes. Wash your hands upon entering the lab and before you leave.

**Lab procedures:**

- Sanitize your Bench when you arrive AND before you leave with the provided paper towels and disinfectant spray. Wash your hands before you leave lab. This is both for your safety AND to keep you from contaminating your own experiments...! It also doubles as COVID safety.
- Be sure you know what protective gear is necessary and to follow general lab safety guidelines. You will wear gloves whenever bacteria are being used.
- Follow proper waste disposal procedures (bacterial/biohazard and chemical waste separate from other waste).
- Clothes toed shoes should be worn and students with long hair should tie it back.
- Leave your backpacks and coats in the atrium area.
- No food, drink, or cellphone use during lab. If you want to use your phone, eat, or drink, feel free to head to the hallway anytime you have some spare time during lab.
- Students should check Canvas and their Geneseo email regularly for course updates.

**Evaluation:**

Grades will be based on criteria listed in the table below.

<b>Activity</b>	<b>Weight (percentage)</b>
Prelab quizzes (Individual)	40 %
Attendance/Participation (0-2 pts per day)*	10 %
Lab questions / reports / presentations	50 %

\*Participation @ 2 points each day of lab

2 points: Present on-time and participated in all activities. Flowchart / notes ready.

1 point can be deducted for any of the following: tardy, left prior to completing activities, failed to participate, or food or cell phone use at the bench

0 points: **Unexcused\*\*** absence.

\*\*In the case of **excused** absence (e.g. illness, quarantine/isolation, or other emergency) your participation for that week will be dropped, and you are responsible for making up any material you missed and preparing for the following week and communicating with your lab partner(s) for group work. Please be in contact with me and your lab partner(s) about any anticipated long term absence so we can make necessary arrangements.

### **Students with Disabilities**

SUNY Geneseo will make reasonable accommodations for persons with documented physical, emotional, or cognitive disabilities. Accommodations will be made for medical conditions related to pregnancy or parenting. Students should contact Ms. Heather Packer in the Office of Disability Services ([disabilityservices@geneseo.edu](mailto:disabilityservices@geneseo.edu) or [585-245-5112](tel:585-245-5112)) and their faculty to discuss needed accommodations as early as possible in the semester. Exams at the testing center should be scheduled for the same day as the exam is held in class.

### **Mental Health Policy**

I take mental health problems exactly as seriously as I would issues with your physical health. Most people at some time in their lives experience an episode of diminished mental health, just as they do at some point experience periods of injury and diminished physical health. Mental health issues including significant stress, mood changes, excessive worry, or problems with eating and/or sleeping can interfere with optimal academic performance. If the source of your symptoms is directly related to this class, please speak with me and I will work together to find a remedy. However, problems with relationships, family worries, loss, or a personal struggle or crisis can also contribute I cannot urge enough how important it is that you know help is available and seek it if you have need. SUNY Geneseo provides mental health services to support the academic success and health of students. Counseling Services, a part of the Lauderdale Center for Student Health & Counseling, offers free, confidential psychological services to help you manage personal challenges that may threaten your well-being. Call 585-245-5716 to make an appointment (and also see this page for emergency resources: <https://www.geneseo.edu/health/emergency-info>)

### **Academic Dishonesty & Plagiarism**

Presenting others' work as if it were your own, or providing such help to others, constitutes academic dishonesty. This is important not only due to fairness, but also so that instructors can provide feedback that is useful to improving your understanding and skills (feedback on work that is not your own is not useful to anyone!). Of course, in the case of group work the product will include input from all members, and of course, students may share data across groups or even classes when appropriate. Any work that you are presenting as your own (including reports, quizzes, etc) must be original to you. If you're struggling in class, please ask for help rather than resort to academic dishonesty! I am here to assist you if you have any concerns. SUNY Geneseo has instituted policies and procedures that must be followed in the event of an occurrence of Academic dishonesty which can be found here: [https://www.geneseo.edu/dean\\_office/dishonesty](https://www.geneseo.edu/dean_office/dishonesty) . Immediate consequences include a report to the department chair and Dean of the College and a loss of points on impacted assignment(s).