BIOL 223: Genetics Laboratory Syllabus
Spring 2020

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).

Instructors:

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Lab Materials:
Students should purchase the lab manual (Green cover/spiral bound, entitled "Biology 223 Genetics Laboratory") from the bookstore. Students will also need to have access to the textbook we use in the Genetics Lecture (Genetics Analysis and Principles by Robert Brooker) as background for several labs. If you do not have it let us know. Students should bring a notebook, calculator, pencil, and sharpie every day, along with their laptop, laboratory coat, and UV safe lab goggles when 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 should work with your lab group to organize for the following weeks' lab. This is best done by drawing a **flow-chart** (which we will check at start of next weeks' lab) and notating who will be doing what for the next weeks' experimental procedures. You should also figure out with your lab mates the purpose of each step & reagent. Doing this is the absolute best way to ensure the lab run smoothly and that you are prepared for the **postlab quizzes** which we will do the end of lab. You will also prepare lab reports and an oral presentation of a lab. If you're confused about experimental procedures or about the results from previous labs, please come to office hours! We'd love to see you!

Date (Thurs/Fri)	Topic (lab manual reading due before lab!)	Special Equipment needed	Assignments Due
Week 1: 1/28-1/29	Introduction, Safety, working with Bacteria (Appendix C)	N/A	Postquiz 1
Week 2: 2/4-2/5	Transformation of *E. coli* (exercise #1)	Lab coats, UV goggles	Ex 1 Flowchart Postquiz 2
Week 3: 2/11-2/12	PCR amplification (exercise #2, Week 1)	Lab coats	Ex 2 Flowchart Postquiz 3 **Approach Minireport (ex. 1)**
Week 4: 2/18-2/19	Gel electrophoresis (exercise #2, Week 2)	Lab coats, Goggles	Postquiz 4
Week 5: 2/25-2/26	Mendelian Genetics (exercise #3) and Environmental Influence (exercise #4, week 1)	N/A	Ex 3&4 Flowcharts Postquiz 5 **Results Minireport (ex. 2)**
Week 6: 3/3-3/4	Environmental influence (exercise #4, week 2) and multiple alleles (exercise #5, week 1)	N/A	Ex 5 Flowchart Postquiz 6
Week 7: 3/10-3/11	Multiple alleles (exercise #5, week 2)	Lab coats	Postquiz 7 **Rationale Minireport (ex. 3/4)**
Week 8: 3/17-3/18	SPRING BREAK NO LAB		**NEW LAB GROUPS FROM THIS POINT ON**
Week 9: 3/24-3/25	Bacterial Conjugation / mapping (exercise #6)	Lab coats	Ex #6 Flowchart Postquiz 8 **Full report 1, group (ex. 5)**
Week 10: 3/31-4/1	Induction of beta galactosidase (exercise #7)	N/A, Lab coats	Ex #7 Flowchart Postquiz 9
Week 11: 4/7-4/8	Final Presentations	Lab coats	Group Oral Presentations **(Ex.2, Ex. 3&4, Ex. 5, Ex. 6, or Ex. 7)**
Week 12: 4/14-4/15	Luria-Delbruck Fluctuation test (exercise 8, week 1)	Lab coats	Postquiz 10
Week 13: 4/21-4/22	GREAT DAY week: WORK ON FIRST PART OF 2nd REPORT!	N/A	NO LAB
Week 14: 4/28-4/29	Luria-Delbruck Fluctuation test (exercise 8, week 2)	Lab coats	Ex #8 Flowchart Postquiz 11
Week 15: 5/5-5/6	Population genetics (exercise 9)	Computers	Ex #9 Flowchart Postquiz 12
5/12 (Finals)	Final written report due	N/A	**Full report 2, individual (Ex 8)**

Procedures:

- Be sure you know what protective gear is necessary and to follow lab safety guidelines
- If bacteria were used, Make sure to clean lab area with disinfectant before you leave, and **ALWAYS** wash your hands before you leave lab.
- Follow proper waste disposal procedures (bacterial/biohazard and chemical waste separate from other waste).
- Leave your backpacks and coats in the atrium area. Food, drink and phones should be left in your backpacks in the atrium and can be accessed in the hallway during breaks.
- Please, no cell phones out in lab! Please take it to the hallway if there's an emergency.

Students should check Canvas and their Geneseo email regularly for any course updates.

Evaluation:

Grades will be based on criteria listed in the table below

Activity	Weight (percentage)
Lab quizzes	40 %
Attendance/Participation/flowcharts	10 %
Lab reports / presentations	50 %

*Participation @ 2 points each day of lab

2 points: Present on-time and participated in all activities (e.g. including that you have the lab flowcharted if required)

1 point can be deducted for any of the following: Tardy, left early, failed to participate

0 points: Unexcused absence

Grading Scale:

Grades are based on the percentage of points you earned, weighted as above (no "curving")
The following scale will be used to calculate final grades, rounding the hundredths place.

	B+ 87.0-89.9%	**C+** 77.0-79.9%	
A 93.0-100%	**B** 83.0-86.9%	**C** 73.0-76.9%	**D** 60.0-69.9% **E** <60%
A- 90.0-92.9%	**B-** 80.0-82.9%	**C-** 70.0-72.9%	

NOTE: In the case of excused absence (e.g. illness or family emergency) your participation for the week will be dropped, but you are still responsible for making up any material you missed and preparing for the following week.

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 or 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

We take mental health problems exactly as seriously as we 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 us and we will work together to find a remedy. However, problems with relationships, family worries, loss, or a personal struggle or crisis can also contribute we 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: 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! We are 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: Acadamic 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).