BIOS 2601: Genetics Laboratory Syllabus

Spring 2027

Lab Sections:

BIOS 2601 A1 27128
Tuesday 12:30-15:15 Boggs I-69

BIOS 2601 A2 27129
Wednesday 12:30-15:15 Boggs I-69

BIOS 2601 A3 30769
Tuesday 15:30-18:15 Boggs I-69

BIOS 2601 A4 35640
Wednesday 15:30-18:15 Boggs I-69

I-69 lab is located on the first floor of the Boggs Building

Instructor:
Dr. Mirjana M. Brockett
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Office location: Cherry Emerson 323
Office hours: Thursday 1-2 or by appointment

Teaching Assistants:
TBA

Lab Coordinator:
Alison Onstine, MSci.
Email: alison.onstine@biology.gatech.edu

Course Description:
This course is based around a term long project that will explore aspects of molecular genetics, evolution, bioengineering, and heredity using fluorescent proteins in a microbial model system. Through this process students will explore important genetics concepts and implement techniques commonly used to generate new knowledge in the field. We will also explore relevant published literature and practice scientific writing in both lab notebook and lab report form. We will discuss the scientific method and its application to genetics principles. This course is intended to accompany and co-required with BIOS 2600 lecture class.
While this laboratory is the co-required companion to BIOS 2600, your grade in each course is independently earned. This course is 1.0 credit hour. You are expected to work for 2.4 full hours in lab each week, and for the additional time required to complete your lab prep and assignments.

Learning Objectives:
By the end of this course, you will be able to:
1) Generate genetics hypotheses using your fluorescent protein experiment.
2) Design experiments and interpret results using basic statistical analysis.
3) Create and troubleshoot genetics lab protocols.
4) Cite relevant genetics primary literature.
5) Write effective and accurate notebook entries, and lab reports in the style accepted by genetics scientific journals.
6) Use appropriate lab safety standards and precautions.

Schedule:
Genetics Lab meets on Monday and Tuesday afternoons from January 19/20 through April 6/7 (additional week, if needed). Full assignment details and due dates are in the schedule below. Because of the project-based nature of this course, there is a strong possibility that the schedule will need to be revised week by week based on the progress made each week. Expect a small quiz or reading assignment each week; the schedule contains the probable quizzes or writing assignments. As for all due dates, some may need to be adjusted to stay aligned with our lab progress.

Required Course Materials:
This course is taught without a commercial textbook, and all course readings and videos are on the course online canvas site. Required pre-lab and homework activities will be announced. Phone and computer use should be restricted to class-related material, and off-task use may result in loss of participation points for that day.

Lab Safety:
Georgia Tech has a strict and strictly enforced policy regarding appropriate clothing in laboratories where chemical and biological materials are handled. Students not conforming with the following requirements will be asked to leave the lab and may not return without appropriate clothing:
1. Long pants must be worn in the laboratory.

2. Close-toed shoes that cover the sides and top of the foot must be worn in the laboratory.
3. Lab coats must be worn when working at the bench. Students are responsible for keeping their lab coats in good condition and reasonably clean so as not to create a hazard. Lab coats must be 100% cotton and cover the wearer to the knees. You can purchase lab coat in the GT Bookstore
4. Safety glasses are required when working at the bench. They must have side shields for splash protection and conform to the wearer's face. Safety glasses must be worn over prescription glasses and contact lenses. Students are responsible for purchasing their own pair of safety glasses and bringing them to each class.

Laboratory safety policies exist to keep you safe and in compliance with federal regulations while working with biological materials. Details will be available on January 19/20, on the first day and each student will be required to sign a safety agreement.

Grading policy:

Grades will be calculated on the following scale:

A: ≥ 90.0%
B: ≥ 80.0% and < 90.0%
C: ≥ 70.0% and < 80.0%
D: ≥ 60.0% and < 70.0%
F: < 60.0%

Points will be based on the following:

Pre-Lab Assessments (~5 or more)	30%
Lab Notebooks	10%
Lab Report Drafts	20%
Participation	5%
Final Lab Report	35%
Total	100%

Attendance:

Given that you are working with others to perform experiments and collect data on an on-going project, there is no mechanism to "make-up" a lab. If you must miss a laboratory, notify the TA's and instructor by email as soon as possible, preferably before the missed lab. Vacation, work commitments, and social events are not acceptable reasons to miss lab. Examples of legitimate reasons to miss a lab include serious illness, illness or death in your immediate family, and participation in official university activities. You will be required to provide documentation for excused absences. Unexcused absences will result in a 10% reduction in your final course grade. Regular attendance and active participation during class time are correlated with better performance in the course. If you experience any situation that causes you to miss more than one consecutive class or otherwise interferes with your ability to keep up with course assignments, we ask that you request assistance from the Dean of Students using this link: https://studentlife.gatech.edu/request-assistance. Select "Class Absence Verification" for documentation of an absence, including missed exams. Select "Meeting with a Dean" for any other issue that is interfering with your ability to succeed in this or any other course. Missed assignments fall under the Missed Exams policy. Missed participation sessions due to absences for any reason fall under the Missed Participation policy.

Pre-lab assessments:
Students are expected to be familiar with the lab protocol and bring the printout or save a digital copy, for each lab! The lab protocols and short, multiple-choice pre-quizzes will be available on your Canvas website, on Friday evenings, before each lab. Pre-lab quizzes concentrate on the upcoming lab material and there are usually 5-7 prelab quizzes in a semester. These assignments are due by 11:55 AM the day of lab (Tuesday or Wednesday). Late submissions will not be accepted. If you miss a pre-lab, you will receive a zero for that pre-lab. You should plan to complete the assigned reading before attempting the pre-lab quiz. Pre-lab quizzes are open book but individual, non-collaborative assignments.

Lab Notebook:
You are required to use your lab notebook each week. You can use a digital notebook, or a Life sciences student lab notebook. Towards the end of the semester, you will submit your original notebook for grading on content, legibility, and thoroughness. A thorough lab notebook will be critical to writing accurate lab reports. In your notebook, you must write in your own words, even if you are working with a partner or group on the experiment. A notebook lab rubric will be provided on Canvas.
Tip: For each step of the experiment, your notebook should include an introduction to the experiment, any deviations from your lab handouts and calculated volumes, reasons for conducting methods, results of experiments you complete, explanation of analyses, and summaries of conclusions. Your notebook should describe the beginning, middle, and end of each experiment—it's rare to set up and analyze an experiment in the same day, so experiments are likely to span multiple weeks if not the entire semester. You can refer to the Lab Notebook rubric to get more details on what we're looking for.

Lab Report:
During the semester, you will generate a full laboratory report in the style of a scientific journal. This report will be written in stages; each stage will receive peer and/or instructor feedback. All lab reports are individual assignments. While lab work is done collaboratively, every component of the lab report, except shared tables and figures (see notebooks above), should be generated by the report's author. There will be several writing assignments due during the semester to encourage you to test your ideas in writing. Each will be submitted electronically to Canvas; each assignment will be announced the week prior and will be due by the beginning of lab. A late assignment will be reduced one letter grade (10%) for each 24-hour period that it is late.
Final Lab Report Due on/before April 30, 2027.

Academic Honesty:
All students are expected to abide by the Academic Honor Code (https://policylibrary.gatech.edu/student-life/academic-honor-code) and the Student Code of Conduct (https://catalog.gatech.edu/rules/18/). Academic dishonesty in any form will not be tolerated. Academic dishonesty includes cheating, lying about course matters, plagiarism, submitting someone else's work as your own, stealing classroom materials, or helping others commit a violation of the Honor Code. Plagiarism includes any form of representing the words or ideas of others as your own.

Cell phones must be off/silenced and placed face-down on the desk during exams. Any student found with a phone or other unapproved electronic device on their person during testing will be referred to the Office of Student Integrity. Suspected violation of the Academic Honor Code in any form may be referred to the Office of Student Integrity for adjudication.

Student-Faculty Expectations:
The Georgia Tech Student-Faculty expectations may be viewed here:
https://catalog.gatech.edu/rules/22/

Students with Accommodations:
We will make classroom accommodations for students with documented accommodation needs per the Office of Disability Services. These accommodations should be arranged in advance and in accordance with the Office of Disability Services (http://www.disabilityservices.gatech.edu). Students with accommodations on exams must schedule their exams at least five business days in advance with the testing center, and exams at the Testing Center must be scheduled to occur on the same day and at the same time as the scheduled exam. Students who are unable to schedule on the same day and time as the exam must have instructor permission to take the exam at an alternative time or day. Students with accommodations on exams forego those accommodations if they choose to take the exam in the classroom.

Academic Support:
Academic Success and Advising provide free support for your courses. Students can attend weekly supplemental review (PLUS) sessions, stop by Drop-In Tutoring, or schedule a one-on-one appointment through Knack. To explore what options work best for you, please visit us online at success.gatech.edu/tutoring, email us at tutoring@gatech.edu, or come see us at Clough Undergraduate Learning Commons, Suite 283. · Communication Center: http://www.communicationcenter.gatech.edu
Individualized help with writing and multimedia projects · Academic advisors for your major: https://advising.gatech.edu/find-your-advisor.
Personal Support: In your time at Georgia Tech, you may find yourself in need of support. A starting point is https://belonging.gatech.edu/studentsupport and below are some direct links to resources available on campus. · The Office of the Dean of Students: https://studentlife.gatech.edu/services/academic-financial-personal-assistance; 404-894-6367; Smithgall Student Services Building 2nd floor · Counseling Center: https://mentalhealth.gatech.edu/ ; 404-894-2575; Smithgall Student Services Building 2nd floor
At Georgia Tech, we are concerned about your overall physical, social, and mental well-being. A comprehensive list of wellness related resources has been compiled and maintained by the Office of the Vice President for Student Engagement and Well-being and can be found here: https://students.gatech.edu/student-resource-guide

This syllabus is subject to change.

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CALENDAR:

1	January 12/13	First Week – No Labs
2	January 19/20	Safety / Introduction / Micropipette exercise / Sterile technique
3	January 26/27	Plasmid DNA extraction, Mutagenic PCR
4	February 02/03	Plasmid DNA extraction, Mutagenic PCR
5	February 09/10	PCR clean up, Double digestion
6	February 16/17	PCR clean up, Ligation, Gel electrophoresis
7	February 23/24	Transformations
8	March 02/03	Transformations II, Assay transformants, streak colonies
9	March 09/10	Spring Break- No labs
10	March 16/17	Colony PCR, Fluorescent Assay set up
11	March 23/24	Gel electrophoresis, Fluorescent Assay set up
12	March 30/31	Sequence Results, Fluorescent Assay Results
13	April 06/07	Phylogenetic analysis
14	April 13/14	Flexible
15	April 20/21	Flexible
16	April 27/28	Final Instruction Days - No Lab

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Dr. Mirjana M. Brockett