

## **BIOL 2345: Genetics Laboratory Syllabus (fall semester 2014)**

### Instructor:

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Classrooms: Monday and Tuesday 12:05–2:55, in CE 123 (wet lab) and/or CE 206 (computer lab). See schedule for where to meet to begin lab each week.

Course Description: This lab is intended to accompany your experience in BIOL 2344 (lecture is a co-requisite for lab). We will do both hands-on and computer simulation experiments that cover basic genetics concepts and techniques. We will also explore the genetics published literature and hone your scientific writing in your lab notebook and when constructing lab reports. We will discuss the scientific method and its application to genetics principles. While this laboratory is the companion to BIOL 2344, your grade in each course is independently earned. This course is 1.0 credit hour.

Course Goals: By the end of this course, you will be able to:

- 1) Identify and interpret basic genetics concepts using through experimentation, analysis, and simulation models.
- 2) Design genetics experiments using various model organisms.
- 3) Write lab reports in the style accepted by genetics scientific journals.
- 4) Cite relevant genetics primary literature.

### Required Textbooks and materials:

- BIOL 2345 Genetics Laboratory Manual Fall 2014 (it will be available only at the Bookstore)
- Genetics textbook
- Life Sciences Student Lab Notebook with Spiral Binding (available at the Bookstore)
- Other Materials: calculator (you will not be allowed to use your cell phone or laptop for wet labs because of risk to your electronics)

Evaluation: Your grade will be calculated using the following scale:

A:  $\geq 90.0\%$

B:  $\geq 80.0\%$  and  $< 90.0\%$

C:  $\geq 70.0\%$  and  $< 80.0\%$

D:  $\geq 60.0\%$  and  $< 70.0\%$

F:  $< 60.0\%$

Points will be based on the following:

Pre-Lab Quizzes (3+)	10%
Lab Notebooks	10%
Tests (2)	30%
Lab Reports (3)	45%
Participation	5%

- 1) Two announced tests (15% each). Midterm exam (covering material from weeks 2-8) during week 9, and a final exam (covering material from weeks 9-14) . These will test your knowledge on the theory behind the labs, and will be administered at the beginning of the lab period.
- 2) Three lab reports (15% each). Formal laboratory write-ups (typed) will be submitted for three labs (Drosophila, Lac operon and a Forensic genetics lab). The report will consist of sections on the lab objectives, background, methods, data, and conclusions. Lab reports should be 3-4 pages in length. All reports are due at the start of your lab section on the date indicated on the schedule. Late reports lose 10% credit per day. After the third day, late reports receive no credit.
- 3) Lab notebook (10%). You are expected to write in your lab notebook during every lab period. As an incentive, you may use your lab notebook on the midterm and final exams. There will be three announced notebook checks. Notebooks will be collected at the end of the lab period on the date indicated on the schedule and returned the following week. Late lab notebooks will not be accepted for credit. It should contain neat, organized, and detailed notes each week. Plagiarism from the lab notebook will not be tolerated. It must include an introduction to the each lab, detailed explanations of the methods you used, reasons for conducting particular methods, experimental results, explanation of analyses, and summaries of conclusions.
- 4) Pre-lab quizzes 3-5 (10%).

Attendance: 100% attendance is expected. Given that you are working with others to perform experiments and collect data, making up a lab is very difficult. If you must miss a laboratory, you must to contact Dr. Brockett and your lab instructor by email (or phone) as

soon as possible, preferably before the missed lab. There will be no make-up laboratories. 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; you will not be permitted to make up work missed in lab. Persistent tardiness may result in loss of points from your participation grade.

Pre-lab quizzes will be posted to T-square under Tests&Quizzes on the Thursday before each new lab. Quizzes concentrate on the upcoming lab material and are **due by 11:55 pm** on the **Sunday** before each lab. Late submissions will not be accepted. If you miss a quiz due to an unexcused absence from lab, you will receive a zero for that quiz. You should plan to complete the assigned lab manual reading before attempting the pre-lab quiz. Quizzes are open-book but individual, not collaborative, assignments.

Lab Manual & Notebook: You are required to bring your lab manual and lab notebook to each lab. This course requires a Life Sciences Student Lab Notebook with Spiral Binding. If you have extra pages from 1510/1520, then you may reuse that notebook. At the end of each lab, you will hand in the carbonless copies of that day's lab activity, labeled with your name and stapled into a packet if there are multiple pages. Your TA will provide periodic feedback, as necessary, regarding your lab notebook content. At 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. The lab manual contains a lab notebook rubric.

Lab Assignments & Reports: Every lab will have either an in-lab activity or a post-lab written report. In-lab activities will be provided in lab and will usually be due before you leave lab (exceptions will be noted during lab). For the post-lab write-ups, you will need to complete the data analysis from lab to write your lab report. There are two full lab reports due during the semester. Lab reports will be due prior to the start of the next week's lab and must be submitted electronically on the T-square "Assignments" menu. An exact list assignments and due dates is shown below in the schedule below. Late assignments will be reduced 10 percentage points for each 24 hour period that the assignment is late.

Participation: Genetics Lab requires cooperative use of materials, awareness of lab safety protocols, preparedness before class, and effective interaction in class. Each class period, your TA will assess your participation in class, for a total of 5% of the course grade. Student use of a cell phone during (computer or wet) lab may result in 0 participation points for that lab period. If you are in a situation where you must leave your phone on, please alert the TA ahead of time and step outside to take the call.

Academic Integrity: Academic dishonesty will not be tolerated. This includes cheating, lying about course matters, plagiarism, stealing classroom materials, or helping others commit a violation of the Honor Code. Students are reminded of the obligations and expectations associated with the Georgia Tech Academic Honor Code and Student Code of Conduct, available online at [www.honor.gatech.edu](http://www.honor.gatech.edu). While students will collaborate in performing the experiments and collecting the data, each student is expected to write his or her own lab

reports, including creating his or her own tables and figures. Plagiarism includes reprinting the words of others without both the use of quotation marks and citation. As direct quotes are seldom used in scientific writing, you are expected to rephrase the words of others and provide the citation. If this is unclear, please ask your TA for help before turning in your assignment.

Learning Accommodations: If needed, we will make classroom accommodations for students with disabilities. These accommodations must be arranged in advance and in accordance with the ADAPTS office (<http://www.adapts.gatech.edu>).

Schedule and Due dates:

Lab Week	Lab Date	Lab topic	Where	Assessment Due*
1	18, 19 August	01: Lab Safety, Scientific Method, & Lab Skills	123	
2	25, 26 August	02: Forensics (Human DNA profiling I part)	123	Lab pre-quiz
	1, 2 September	<b>Labor Day Holiday - No lab</b>	-	
3	8, 9 September	02: Forensics (Human DNA profiling II)	123	Lab Notebook check
4	15,16 September	03: Genome Database	206	
5	22, 23 September	04: Lac Operon part I	123	<b>Forensic Lab Report Due</b> Lab pre-quiz
6	29, 30 September	04: Lac Operon part II <b>Midterm 1</b>	123	
7	6, 7 October	05: Mendelian Genetics (Dihybrid and Sex-linkage)	123 & 206	Lab Notebook check Lab pre-quiz
8	13, 14 October	<b>Fall Break - No lab</b>		
8	20, 21 October	05: Mendelian Genetics (Analysis of results)	123	
	27, 28 October	06: Bacterial Conjugation and Mapping	206	<b>Lac Operon Report Due</b>
10	3, 4 November	07: Examining Cross Over Frequency I	123	
11	10, 11 November	07: Examining Cross Over Frequency I	123	Lab Notebook Due
12	17, 18 November	08: Yellow Jacket Lab (Population genetics)	206	<b>Drosophila Lab Report Due</b> Lab pre-quiz
13	24, 25 November	<b>Lab Midterm II/</b> Course wrap up	123	
14	1, 2 December	<i>Dead Week, No lab</i>	-	

Note: This Lab syllabus is subject to change

