BIOL 2345: Genetics Laboratory Syllabus (Spring 2016)

Instructor:

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Classrooms: Section A: on Monday 12:05-2:55, and C: 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 Spring 2016 (available only at the Bookstore)
- Text book (the same as for lecture)
- 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: ≥ 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 Quizzes (5+)	15%
Lab Notebooks	10%
Tests (2)	40%
Lab Reports (2)	30%
Participation	5%

1) Two announced tests (20% 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) Two lab reports (15% each). Formal laboratory write-ups (typed) will be submitted for two labs (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 (and post lab if needed) quizzes 5-7 (15%).

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 recommends a Life Sciences Student Lab Notebook with Spiral Binding. If you have extra pages from 1510/1520, then you may reuse that notebook. 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. 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. For more information please visit: http://disabilityservices.gatech.edu/

Schedule and the Due Dates:

Lab Week	Lab Date	Lab topic	Where	Assessment Due*
	11, 12 January	*First week of classes, No labs*		
	18, 19 January	*Martin Luther King Holiday* *No Labs*		
1	25, 26 January	01: Basic tools: using Micropipetors	123	Lab Safety Agreement
2	1, 2 February	02: Observing mitosis in Onion roots *Planning the main genetic experiment*		Lab pre-quiz and practice
3	8, 9 February	03: Intro to PCR as a Tool in Forensics (part 1)	123	Lab pre-quiz
4	15, 16 February	Forensics lab (part 2)	123	*1st notebook check*
5	22, 23 February	04: Genome database	206	Lab pre-quiz
6	29 February and 1 March	05: Mendelian Genetics Lab set up (P generation) *Developing experiment*	123	Lab pre-quiz
7	7, 8 March	06: Examining Crossover frequency in *Sordaria fimicola* Lab Midterm I	123	*2nd notebook check*
8	14, 15 March	Mendelian Genetics and Drosophila (F1 generation crosses)	123	Forensic Lab Report Due
9	21, 22 March	*Spring Break, No labs*	123	
10	28, 29 March	07: Regulation of the Lac Operon in *Escherichia coli* (part 1) Mendelian Genetics and Drosophila (F2 generation crosses)	123	Lab pre-quiz
11	4, 5 April	Regulation of Lac Operon in E. coli (part 2) 08: Transformation Lab (part 1)	123	*3rd notebook check*
12	11, 12 April	09: Paternity Testing in *Vespula* Species (Yellow Jacket Lab) Transformation lab (part 2)	123, 206	Lab pre-quiz
13	18, 19 April	Lab Midterm II Course wrap up/Notebook pick up	123	Drosophila Lab report Due
14	30 November and 1 December	*NO LABS!* Last week of classes		Lab notebook return