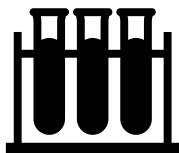


Biology 2107L – Principles of Biology I Laboratory Syllabus

Georgia State University @ Perimeter College -
Dunwoody Campus

Term: Spring 2023 Section #: 052 (CRN 13756)

Instructor



Name: JoDi Lynn Osborn-Ward, PhD (Dr. Osborn; she/her)

Office: NE-2604

Student Drop-In Hours: MW 2:30 – 4:30 pm, T 10:00 am to 12:00 pm, R 1:00 – 3:00, or
by appointment

E-mail: josborn1@gsu.edu (preferred method of contact) **Phone:** 770-274-5055

E-mails will be answered within 24 hours M – F. **Please do not contact me through iCollege.**

This course syllabus provides a general plan for the course; deviations may be necessary.

Class meeting location: Room NE-1140

Class meeting day and time: T 1:00 – 3:45 pm

Prerequisites: CHEM 1211/CHEM1211L or CHEM 1211K with a "C" or better.

Co-requisite: BIOL 2107 lecture. You must be registered for **both** lab and lecture **at the same time**.

Withdrawal from either lecture or lab will result in automatic withdrawal from both. It is strongly suggested that you take lecture and lab on the same campus and on the same schedule (half term or full term). Lab topics **on this campus** follow the order of lecture topics **on this campus**. If you take lecture on a different campus, topics may be covered in a different order.

Course description: Laboratory based application of topics covered in BIOL 2107 lecture. Topic coverage includes the scientific method, theory and experimentation, cell chemistry, enzymes, metabolism, photosynthesis, genetics, and evolution, and a survey of selected organisms. Fulfills Biology major requirement

Course objectives: As a result of completing this course, the student will be able to:

1. Design and perform scientific experiments as well as analyze and interpret results and present written discussions.
2. Use laboratory skills and techniques such as: microscopy, chromatography, electrophoresis, PCR, culture of organisms, spectrophotometry, and statistical and graphing techniques.
3. Use observational skills that allow students to identify and diagram characteristics of organisms based on examples provided by living organisms, models, and microscope slides.

Required text: Shanholtzer 2018 Biology 2107-2108 Lab Exercises, 2nd edition (ISBN 978-0-7380-9820-3)

Note: The laboratory manual is custom for Perimeter campuses and must be purchased at the bookstore. It is not available on Amazon.

Grade determination:

Lab grades are independent of lecture grades. You pass or fail lab on its own merit.

The final letter grade will be determined in the following manner:

		Percent	Grade
Tests	60%		
Scientific Writing	20%	90 - 100 %	A
Pre-labs	5%	80 - 89 %	B
Data Summaries	5%	70 - 79 %	C
Post-labs	10%	60 - 69 %	D
		<60 %	F

Test I and II will be practical in format and will include identification and short answer questions. Test I will cover material through the midpoint of the semester. Test II will cover material from the midpoint through the end of the semester. Test II will not be comprehensive.

Scientific Writing. Each scientific discipline has slightly different styles. Therefore, students should consult "Scientific Writing Guidelines" at the end of the syllabus and the guidelines posted on iCollege. Assignments will be given throughout the semester so that I can give you feedback as you learn how to write a scientific paper. You will then pick one of two labs to write a scientific paper on.

Schedule:

While every effort will be made to adhere to the lab schedule, deviations may be necessary due to inclement weather or unforeseen emergencies (such as murder hornets). The schedule is posted in the "Syllabus and Schedule" folder on iCollege.

Pre-Lab Preparation:

This is a "flipped" classroom, meaning that you will need to read through materials and watch some videos before class. These will be brief and not take up too much of your time. However, take good notes...

Pre-Lab Quizzes:

We will start each day in lab with a multiple-choice pre-lab quiz. These are OPEN NOTES. However, your notes need to be in hard copy, either hand-written or printed out. **No electronics may be used during the quizzes.**

Daily Data Summaries:

In lieu of keeping a lab notebook that is only checked twice per semester, you will complete a data summary for each class meeting. These will be posted in PDF format in advance. You are required to print them out and bring them with you to class. You will gather all data on the data summary forms and include any attachments required. Data Summaries are due the following class meeting. While data is collected in pairs or in groups of four, your hypotheses, data analyses, and answers to questions should be your own.

Post-Lab Questions:

Weekly post-lab questions will be due via iCollege by the start of class every week. Questions may be multiple choice, multiple select, matching, or fill in the blank. Although delivered via the “quizzes” option on iCollege, these are open book/notebook/internet. The grade received will be the average of two attempts.

Academic Honesty Policy

Policies have been established by Perimeter College to insure due process in charges of cheating or plagiarism. A copy of these procedures can be found at (<http://www2.gsu.edu/~wwwfhh/sec409.html>). Cheating includes any attempt to defraud, deceive, or mislead the instructor in arriving at an honest grade assessment. Plagiarism is a form cheating that involves presenting the ideas or work of another as your own. Cheating includes, but is not limited to:

1. On a test or quiz: looking at or copying from another student's work, allowing another student to copy your work, exchanging written or oral communication, using notes, or opening a text book.
2. On out-of-class assignments (including scientific papers): copying from another student or printed source without citation, having another person do your work, or allowing another student to use your work as his/her own.
3. Providing false documentation in order to be allowed to make up a missed test or assignment or to document an excused absence.

A grade of zero will be assigned for any test or assignment found to be in violation of the academic honesty policy.

Note: All content created in this course, including videos, handouts, etc., may be used only by students enrolled in the course for purposes relating to the course. No materials may be shared with students outside of the class or posted in any external forum. Failure to abide by these limitations constitutes a violation of the Policy on Academic Honesty and will be treated accordingly.

The LTC offers FREE, walk-in tutoring and academic support at FIVE Perimeter College campuses. The LTC provides a variety of other resources and services to accommodate student needs. All LTCs are equipped with computers, instructional software, and internet access. Please visit the LTC's website (i.e. success.students.gsu.edu/ltc) to find information about locations, hours of operation, tutoring, workshop schedules, handouts, online tutoring, and links to online practice resources.

Attendance:

1. Students who miss lab exercises perform very poorly in this course. The primary objective of any lab course is to provide the student with a “hands-on” experience that will support and illustrate the concepts covered in the lecture portion of the course. Lab is about seeing and doing. **Therefore, consistent and timely attendance to lab is a must for success in this course!**
2. **There will be no make-up lab exercises.** Due to logistical and safety concerns, “wet labs” (labs requiring the use of equipment, chemicals, solutions, etc.) **cannot be made up.** Any grades collected during the missed class, such as quizzes, cannot be made up and will be recorded as a zero. If a student misses a laboratory exercise, the exercise cannot be used for a laboratory report. Students are responsible for any information covered in their absence. Open lab time will be available on the Fridays before lab exams (8:00am-12:00pm) for review of slides, models, and some living specimens only.
3. Lab will start **promptly** at the scheduled time. Important introductory and safety information will be given at the beginning of each lab. Late arrival to lab will affect your understanding of the entire lab exercise

and may pose a safety hazard to you and other students. If a quiz is given at the beginning of the lab, **a student arriving late will not be allowed to take the quiz.**

4. The "practical" format of lab exams makes "make-up exams" difficult to arrange and administer; each student should make every effort possible to be on time for lab exams. However, in the event of a verifiable illness or emergency, students should contact the instructor by the date of the exam. A comprehensive final may be given at the end of the term to compensate for the missed exam.

5. **Students must be on time for their scheduled exams.** Students entering after the exam has begun may not have time to finish the exam due to time constraints.

Course withdrawal: Any student who has not attended this class at least once during the first two weeks of the academic term will be reported as not having attended, which will result in them being removed from the class roll and also from any co-requisite lecture course. Once students who've not attended during the first two weeks have been reported for removal, your instructor will not be doing any instructor initiated withdrawals during the remainder of the term. It is each student's responsibility to attend class regularly and complete all assignments on time. If you do not do so your grade will be penalized as stated elsewhere in this syllabus. It is also each student's responsibility to complete and submit a withdrawal form before the term midpoint (see GSU academic calendar) if they do not want to receive a final grade in this course. Students who do not withdraw themselves by the term midpoint will receive a final grade in the course calculated with penalties or grades of zeroes for all late or un-submitted work. Perimeter College students are limited to a maximum of 3 course withdrawals (lecture and lab count as one withdrawal since they are co-requisites). Any withdrawals above 3 are recorded as WF on the student transcript. (<http://www2.gsu.edu/~wwwfhh/sec401.html#401.03>) (<https://catalog.gsu.edu/associate20162017/university-academic-regulations/#dropping-classes-and-voluntary-withdrawal>)

Grade of "Incomplete": A grade of incomplete ("I") may be assigned at the instructor's discretion if a student 1) is earning a passing grade at the time the incomplete is requested, and 2) has completed most of the major assignments, generally all but one, and 3) cannot complete the remainder of the coursework due to non-academic reasons beyond the student's control. If an instructor denies a student's request for an incomplete, the student may appeal to the department chair. The decision of the department chair is final.

Computer Usage and Printing: The computers in the lab rooms are to be used only for lab exercises which require a computer. Lab time is valuable and should be used for completing the required exercises. Checking e-mail or web surfing for entertainment purposes should be done in the open computer labs located on the ground floor of E-building. Use of the laser printer in the lab is restricted to those specific exercises which require that data be printed. Paper in the lab is to be used for these experiments and for drawings only. Under no circumstances should the lab printers be used to print e-mail, lecture notes, lab notes, or research/term/lab papers.

Laboratory Supplies: Pencils, paper, gloves, and goggles (labs requiring gloves and goggles are indicated on the schedule). *There are no gloves or goggles available, you must bring your own.

Laboratory Safety Policies & Procedures:

General Lab Safety

1. Only students enrolled in the laboratory course are allowed in the laboratory.
2. No one is allowed to eat, drink, smoke, or apply cosmetics while in the lab.
3. Shoes that completely cover the feet are required for lab. Bare feet, sandals, and open-toed shoes are not allowed.
4. Long hair, dangling jewelry, or loose clothing should be tied back or otherwise confined during lab.

5. Desk areas should be kept uncluttered. The tabletop area is not to be used for materials that are not essential to the experiment (e.g., pocketbooks, lecture text books, etc.).
6. Desktops must be cleaned after each laboratory meeting.
7. Gloves and goggles must be worn while working with preserved specimens, hazardous chemicals, or as indicated by your instructor. The labs that require gloves and goggles are indicated on the course schedule.
8. In the event of any accident, notify the instructor immediately. **Do not attempt to clean up broken glass or spilled chemicals yourself.**
9. Bandage all cuts on hands before dissecting or using chemical reagents.
10. Small sharp objects such as used slides or small pieces of broken glass should be placed in a Sharps container or other container as indicated by your instructor.
11. No lab material of any kind may leave the laboratory.
12. No students are allowed in the laboratory outside regular laboratory class time unless Science Dept. Supervisory Personnel or a faculty member is present.
13. Know the location of emergency equipment, emergency exit locations, and telephone. Report any condition that appears unsafe or hazardous to your instructor.
14. Wash hands before leaving the laboratory.
15. Microscopes are to be put away properly with scanning objective in place, cord wrapped with Velcro, and mechanical stage is centered so that extended arms DO NOT hit into other scopes or walls of the cabinet.

Chemical safety

1. Some chemicals used in this laboratory may be absorbed by contact lenses. It is advisable to remove contacts before lab or wear tight fitting goggles during lab exercises that will involve these chemicals.
2. Dispose of all chemical waste in the proper waste container as indicated by your instructor. **NEVER pour any chemical down the sink without permission from your instructor.**
3. Do not taste chemicals or pipette solutions by mouth.
4. Wash your hands if you contact any chemical solution. Assume that all reagents are poisonous and act accordingly. Read labels on chemicals for any safety precautions and know the nature of the chemicals you are using.
5. Students with special conditions (pregnancy, nursing mothers, allergies, depression of immune system through such things as disease, chemotherapy, transplants, etc.) should be aware that science laboratories contain materials which, if handled improperly, may have a hazardous effect on them. These students should contact their doctor for advice about continuing in the laboratory. Students who wish to withdraw from a laboratory after consultation with their doctor should submit a letter from the physician within the first two weeks of class indicating that the student should not continue in the laboratory due to a health risk. Information about the chemical compounds used in science laboratories is available from the lab coordinator

Biohazard safety

1. Any biologically contaminated items (toothpicks, sheep blood, swabs, slides) must be placed into the appropriate disposal container as indicated by your instructor.
2. Students must only handle their own cheek cells and bodily fluids.
3. Do not use the microscope if you have an eye infection.
4. Preserved animals that are used over multiple lab periods must be sprayed with preservative, placed in an appropriate storage bag, sealed, and placed in your group's bin or can at the end of each lab period. Any parts from the animals must be discarded into the biohazard container as indicated by your instructor. Organisms that are used for only one class period must be discarded into the biohazard container as well.

Open Lab Policies:

Open labs for independent study and review will be provided on some Friday mornings from 8:00am – 12:00pm if the lab room is not scheduled for another lab course. Due to logistical and safety concerns, “wet

labs” requiring the use of equipment, chemicals, solutions, etc. cannot be performed during open lab. Your instructor may not be present, and supervisory staff will not have time to tutor you on laboratory exercises. They will answer limited questions as time permits. It is your responsibility to complete your lab during the scheduled lab hours and to use this time for review of slides, models, and selected living specimens only. To prevent overcrowding and distractions, students are not allowed to enter the lab when another lab class is in session. It is sometimes necessary to cancel open labs in order to set up practical exams for other classes using this lab or due to lack of supervisory personnel.

All lab rules apply during open lab. No children are allowed in the lab at these times. No eating or drinking allowed in the labs at any time. It is your responsibility to clean up and put away anything you use during this time. Failure to do so will result in the cancellation of open labs for everyone.

Course evaluation: Your constructive assessment of this course plays an indispensable role in shaping education at Perimeter College. Upon completing the course, please take the time to fill out the online course evaluation.

Copyright of course materials: Course materials are protected by copyright. Your instructor is the owner of the copyright and under this copyright: 1. You are NOT free to copy, distribute, display, and/or perform the work; 2. You may NOT use this work for commercial purposes; 3. You may NOT alter, transform, and/or build upon this work.

Tobacco and Smoke-Free Campus Policy: Georgia State University (“Georgia State”) is committed to providing a clean, healthy, and comfortable environment for all students, faculty, staff and visitors. The use of tobacco products is prohibited on all property owned, leased or used by Georgia State, including but not limited to all internal and external areas; parking garages and parking lots; and in Georgia State owned and/or leased vehicles. Such use is also prohibited within 25 feet of all Georgia State building entrances and exits.

Disruptive Behavior Policy: Disruptive student behavior is student behavior in a classroom or other learning environment (to include both on and off-campus locations), which disrupts the educational process. Disruptive class* behavior for this purpose is defined by the instructor.
(<http://www2.gsu.edu/~wwwsen/minutes/2006-2007/disrpt.pdf>)

Americans with Disabilities Act Statement: If you are a student who is disabled as defined under the Americans with Disabilities Act and requires assistance or support services, please seek assistance through the Center for Disability Services. A CDS Counselor will coordinate those services.

GSU e-mail: Every student is assigned an official Georgia State University email address at the time of acceptance. It is essential that students regularly check this email account. Academic departments and student service units across campus use the University assigned email as a means of communicating with students about official university business, and students are held responsible for this information. Email from Georgia State will be sent to the student’s official Georgia State e-mail address. It will not be sent to any other address (such as a Gmail or Yahoo account). However, students may configure their Georgia State account to forward to another address.

Equal Opportunity Statement: No person shall, on the grounds of race, color, sex, religion, creed, national origin, age, or disability, be excluded from employment or participation in, be denied the benefits of, or otherwise be subjected to discrimination under any program or activity conducted by Perimeter College.

Affirmative Action Statement: Perimeter College adheres to affirmative action policies designed to promote diversity and equal opportunity for all faculty and students.

Disability accommodation: Students who wish to request accommodation for a disability may do so by registering with the Office of Disability Services. Students may only be accommodated upon issuance by the Office of Disability Services of a signed Accommodation Plan and are responsible for providing a copy of that plan to instructors of all classes in which accommodations are sought.

Sexual misconduct: The University System of Georgia is committed to ensuring a safe learning environment that supports the dignity of all members of the University System of Georgia community. The University System of Georgia does not discriminate on the basis of sex or gender in any of its education or employment programs and activities. To that end, this policy prohibits specific forms of behavior that violate Title IX of the Education Amendments of 1972. The University System of Georgia will not tolerate sexual misconduct, which is prohibited, and which includes, but is not limited to, domestic violence, dating violence, sexual assault, sexual exploitation, sexual harassment, and stalking. The University System further strongly encourages members of the University System community to report instances of sexual misconduct promptly. These policies and procedures are intended to ensure that all parties involved receive appropriate support and fair treatment, and that allegations of sexual misconduct are handled in a prompt, thorough and equitable manner. Prevention is one of the primary mechanisms used to reduce incidents of sexual violence on campuses. USG institutions are required to provide prevention tools and to conduct ongoing awareness and prevention programming and training for the campus community including students, faculty, and staff. Such programs are designed to stop sexual violence through the promotion of positive and healthy behaviors. Programming will educate the campus community on consent, sexual assault, alcohol use, dating violence, domestic violence, stalking, bystander intervention, and reporting.

Campus Carry: The campus carry legislation allows anyone properly licensed in the state of Georgia to carry a handgun in a concealed manner on university property with noted exceptions. Information about the law can be found at safety.gsu.edu/campus-carry. It is the responsibility of the license holder to know the law. Failure to do so may result in a misdemeanor charge and may violate the Georgia State Student Code of Conduct.

Scientific Writing Guidelines

A complete laboratory report should follow the general form used in writing a professional scientific paper. The material in the report should be organized into six sections. Your lab report **must** contain the sections indicated below. With the exception of the title page, each section (intro, methods, etc.) should be labeled to make your report easier to follow. **A rubric and information about how to write each section will be provided. Please refer to them frequently while writing.**

Title Page: You should have a title that is limited to your subject matter, but as descriptive as possible. Avoid overly general titles, ex. "The termites." A more appropriate title might be, "A demonstration of ink preferences in wood-dwelling termites." This page should also include a list of your fellow experimenters. While you will complete the experiments in groups, each student must individually complete and write his or her own lab report.

Introduction: Lead with a catchy but scientifically accurate statement (this is called "the hook"). This section should introduce the topic of your experiment and should include any **PERTINENT** background information needed to understand the experiment. The information should introduce the **ENTIRE** set of experiments. You will have **ONE** introduction section for your entire paper. Do not go into detail regarding how experiments work, just provide information about the subject matter. Cite references for background material where appropriate. At the end of this section, you should state the major objective or purpose of your experiment (this should be concise) and **clearly** state your hypothesis.

Materials and Methods: In this section, you should describe the materials used and the **EXACT** procedures that you followed while performing your experiment. If you used a different procedure than listed in the lab manual, you should describe the procedure that you **actually used**. A person should be able to read this section and perform your experiment exactly the way you did. Do not give the results of your experiment in this section, only materials and procedures. This section should be in passive past tense and provide enough detail

that a skilled individual could repeat the experiment. If something can be done more than one way, do not mention how it was done. For example, if you chopped up spinach leaves with a razor blade, the important information is that they were chopped, not how it was done. Also, do not mention things such as "writing down data" or "labeling tubes" as these are things a skilled individual would know to do.

Results: This section should include 2 parts: 1. a written description of the results in the body of the paper; 2. graph(s) or table(s) **on a separate page** displaying the results. Do not explain or comment on the significance of the results here, just give the data. Every table or graph must have a descriptive title ("termite data" is **not** descriptive enough) and labeled axes with units of measure clearly indicated. Tables consist of columns and rows of numbers or other information and should be numbered in sequence and referred to in the written results section, ex. "Termites followed the red ink for an average of 5 seconds (Table 1)." Graphs are called figures and are referred to in the same manner, ex. Fig.1. All figures or tables must be included in the paper and referenced within the text. Figure legends should include a figure number, title, and description. If you want to show a trend with numeric data, use a graph rather than a table.

Discussion: In this section, you should indicate if your hypothesis was supported, explain your results, and indicate the significance of the results. The first sentence of your discussion should be your hypothesis followed by whether or not it was **supported** by your data. A hypothesis cannot be **proven** by a single experiment. You should interpret your results as "supportive of" or "failed to support" the hypothesis. To the best of your ability, you should explain what was occurring during your experiment, why you got the results that you did, and any possible sources of error. You should also indicate the significance of your results. How might this information be used? What are the implications of your results? Lastly, you may want to develop further experiments that might be used to lend more support to the hypothesis, or develop a totally new hypothesis based on your results.

Literature Cited: Whenever you cite a fact or an idea, cite the reference giving credit to your sources. This should be done in the body of the report so that it is clear to the reader. For example: "That cytochrome included three distinct enzymes was first shown by Keilin (1925)" or "It is known that cytochrome consists of three distinct enzymes (Keilin, 1925)." The literature cited section consists of a list of references which should include the author's name, initials, year of publication, journal, specific volume, and the pages. For example: Keilin, D., 1925. Proc. Rev. Soc. London, B98: 312-329. When referencing books use the following form: Eckert, R., and D. Randell, 1978. Animal Physiology. 1st ed. W.H. Freeman and Co. 510 pp.

Additional Guidelines:

1. The report should be concise, but include all of the required information. Four to six typewritten pages should be sufficient.
2. Avoid the first person, ex. "the termites were placed on the paper, and the time each termite followed each line measured with a stopwatch" **not** "Suzi placed the termites on the paper, and I timed how long each termite followed the lines."
3. Use precise English and avoid useless words such as "First,...Next,...Then,..." or "then we proceeded to."
4. Use complete sentences with good grammar and spelling.
5. You must always rephrase facts. Do not cut and paste from your sources. This is plagiarism and will be turned in for academic dishonesty.
6. **Quotations are not allowed in scientific writing. Rephrase the information and cite the source.**
7. Use the rubric provided to check your work thoroughly before turning in your paper.