



Valdosta State University, Department of Biology
BIOL 1107: Principles of Biology I (Lab syllabus) Fall 2014

Instructor: Dr. Joshua S. Reece
Classroom: BSC 1083 on Wednesdays from 9am to 11:50am
Office: Bailey Science Center Room 1213 Phone: 229-219-3293
Email: jreece@valdosta.edu (preferred contact method)
Office hours: Wednesdays 12pm-1pm and 4-5pm, and by appointment

****note****

This syllabus is a working document and subject to modification by the instructor

Course Overview

Welcome to Bio1107 Lab. This course is a required companion to the lecture portion of Bio1107. The laboratory exercises in this course will complement the material presented in lecture. A major theme in this course will be the scientific method, and getting you to “think like a scientist.” You will be applying what you have learned in the classroom and from your laboratory manual to generate hypotheses, design experiments, test hypotheses, and make inferences about the natural world.

Course Objectives and Linked Assignments

The broad objectives of this course are to introduce you to the scientific method and to apply that method to understand scientific principles and biological phenomena. You will learn new technologies and techniques, learn concepts by experimentation, learn scientific writing, and be able to analyze, evaluate, and make inferences from oral, written, or visual materials.

Objectives	Linked Assignments
Understand and implement the scientific method	Week 1 Lecture, Exercise 1 Lab, reading assignment, Quiz 1
Excel at light microscopy and observe living cells	Exercises 2, 3 and 4 Labs, Quizzes 2 and 3
Experiment with osmosis and diffusion	Exercise 5 Lab, Quizzes 3 and 4
Work collaboratively in small groups	All Labs, Assignment 1
Write scientifically	All Labs, Week 1 Lecture, Project Proposal, Assignments 1-3, Lab Notebook
Understand how to extract and quantify proteins	Exercise 6 Lab, Quizzes 5 and 6
Understand and experiment with enzyme function	Exercise 7 Lab, Quizzes 7, 8 and 9
Understand mitosis, meiosis and cytokinesis	Exercise 10 Lab, Quizzes 9 and 10
Understand Mendelian genetics	Genetics Lab Exercise, Quizzes 10 and 11, Assignment 2
Use restriction enzyme digests of DNA for forensic scientific experimentation	Crime Scene Lab, Quizzes 11-13

Course Prerequisites and expectations

There are no prerequisites for this course, except that you are also enrolled in the lecture portion of

Bio1107.

Course Credits

BIOL 1107 is a 4 credit course, and the Lab section of the course will contribute 25% of your grade.

Required Texts and Materials

Goddard, R. H. 2013. Methods and Investigations in Basic Biology. Sixth edition. Hayden-McNeil Publishing, Plymouth, Michigan.

Basis for Final Grade

Lab Grade (25% of BIOL 1107 grade)
Quizzes (12*): 10 points each
Lab assignments (2): 25 points each
Lab notebook (1): 25 points
Lab assessment (1): 25 points
*The lowest quiz grade is dropped

Average Percent Lab Grade = ((total # points earned / possible points earned so far) * 100)

Your lab grades will be posted to the BIOL 1107 section Grade Book on Blazeview. Assignment grades will be made available the week after they are due unless otherwise indicated. Students will have until the end of the following week to contest any grades; after that time grades are final. Any questions about grades must be made in writing through email.

Lab quizzes. There will be a 10 point quiz at the beginning of each lab session, so do not be late for lab! Quizzes will be taken only using your Turning Point clickers. **You are required to use Response Card XT clickers**, which are available in the VSU bookstore. Always carry an extra battery to class. If you do not have a clicker, or if your battery dies, you get a zero for the quiz, no exceptions. The quizzes will be based on material from the previous labs and the current lab, so you are required to read the lab for each day **BEFORE** coming to class. Quizzes are open notebook, but the lab manual may not be used. Grades for lab quizzes will be available at the end of each week on Blazeview, unless otherwise noted. If there is an error with your quiz grade you must contact me on the week the quiz is given, as grades will become final by the following week.

Lab Assignments. Each assignment is worth 25 points. Questions regarding assignment grades must be made during the week the grade has been given to you, as grades will become final by the following week. Assignments are due at the start of class unless otherwise directed, and will not be accepted late.

Lab Notebook. Students are required to keep a lab notebook in a ½” 3-ring binder. The lab notebook will be used on weekly lab quizzes and will be turned in the last day of lab to be graded. Your notebook grade will be based on completeness, accuracy, and order. More information can be found in the lab manual.

Attendance Policy: Students who miss two labs without an excuse or three labs total cannot receive a lab grade above a “D” (60%). Attendance will be recorded using the lab quiz, which will be given the first 10 minutes of the lab. So, do not be late to lab. In the event that a student misses a lab with an excuse, s/he should email the instructor within 24 hours of the missed lab. It is the instructor’s prerogative to accept the excuse or not. **Absolutely no laboratories can be made up, and no work will be accepted late.** If you are more than 15 minutes late, you may not be allowed to enter the lab, so please be on time.

Student Conduct

You will be respectful of your classmates and your instructor. Cell phone use is not allowed during lab. One point will be taken off of your quiz if a cell phone is observed during lab for any purpose. This includes checking your text messages. Refer to the lab manual for lab rules.

Course Policies: Technology and Media

Email: Please email me only from a VSU email account. I am unable to respond to emails from non-VSU accounts.

Classroom Devices: As noted above, you may NOT use your cell phones in class under any circumstances. Please bring calculators when needed. Timers will be made available when necessary.

Classroom Response Clickers:

We will be using “clickers” in class on a regular basis. You will need to purchase a ResponseCard XT clicker from the bookstore or computer store and bring it with you to every class session. It would be wise to bring extra batteries as well, as we will be using the clickers in activities that count for class points. The purchase of a clicker is NOT optional; it will be used as an integral part of this course. I will provide a short demonstration of how to use it in class. Note: the clicker can be used in other classes if it is the same version/generation. Check with your other instructors to be sure. After you purchase your clicker, you must register your clicker online for this class. It is imperative that every student register their unit no later than the first week of class. Instructions for the registration process can be found online. Purchase your clicker at the Computer Store or the Bookstore. Note that if you forget your clicker, you will get a zero for the quiz and you will be noted as absent from that lab.

Accommodations Statement

Students with disabilities who are experiencing barriers in this course may contact the Access Office for assistance in determining and implementing reasonable accommodations. The Access Office is located in Farber Hall. The phone numbers are 229-245-2498 (V), 229-375-5871 (Video Phone), and 229-219-1348 (TTY). For more information, please visit <http://www.valdosta.edu/student/disability> or email access@valdosta.edu.

Academic Integrity

Academic integrity is the responsibility of all VSU faculty and students. Students are responsible for knowing and abiding by the Academic Integrity Policy as set forth in the Student Code of Conduct and the syllabus. All students are expected to do their own work and to uphold a high standard of academic ethics. Cheating (including plagiarism) will not be tolerated. The instructor reserves the right to dismiss you from the course without credit if you are caught cheating. You will be respectful of your instructor and your fellow students at all times, or you will be dismissed from the class and potentially the course.

Tentative Laboratory Schedule, BIOL 1107, Fall 2014

LABORATORY EXERCISES:

Lab	Week of:	Topic:	Assignments
1	Aug 18	Lab Introduction – What is Science and Ex. 1 Black box/scientific method	
2	Aug 25	Ex. 2 Basics of the Light Microscope	<i>Quiz 1</i>
	Sept 1	Labor Day Week – No Labs	-----
3	Sept 8	Ex. 3 Observation of Living Cells with Light Microscopy and discuss independent microscopy lab proposals	<i>Quiz 2</i>
4	Sept 15	Ex. 5 Cellular Water Relations	<i>Quiz 3</i>
5	Sept 21	Ex. 4 Independent Group Microscope Project	<i>Quiz 4, Begin Assignment 1</i>
6	Sept 29	Ex.6 Protein extraction & quantification	<i>Quiz 5, Assign.1 first draft due at beginning of lab, Assign. 1 final draft due Friday, Oct. 3, 1:00pm.</i>
7	Oct 6	Ex. 7 Enzymology: α -amylase activity	<i>Quiz 6</i>
8	Oct 13	Ex. 8 Enzymology: Investigation of the effects of temperature on enzyme activity	<i>Quiz 7, Begin Assign. 2</i>
9	Oct 20	Ex. 9 Photosynthesis	<i>Quiz 8, Assignment 2 due Oct. 24, 1pm</i>
10	Oct 27	Ex. 10 Cell reproduction: Mitosis, Meiosis, & Cytokinesis	<i>Quiz 9</i>
11	Nov 3	Crime scene Lab	<i>Quiz 10</i>
12	Nov 10	Ex. 12 VNTR Lab	<i>Quiz 11, Notebooks Due at end of Class</i>
13	Nov 17	Ex. 14 PGLO transformation	<i>Quiz 12</i>
14	Nov 24	No Labs- Thanksgiving Break	
15	Dec 1	Read PGLO samples and end of course assessment	<i>Quiz 13 (replacement quiz), Course Assessment</i>

*Final Exam dates will be posted, and will fall between December 4th and 6th.

Grading Rubric for Assignment #1 (Lecture) Lab Reports: 25 points

Lab Report should be at LEAST 3-5 pages, Times New Roman 12-pt font, Double spaced, 1 inch margins

Section & Points	Description of Expectations	Points
Title (0.5 pt)	The title is short and to the point and concisely conveys what the paper is about.	
Abstract (1.5 pts)	The abstract contains a well organized and written, concise and complete summary of the paper.	
Introduction (4 pts)	Successfully establishes the scientific concept of the lab by providing clear and complete background information. Effectively presents the objectives and purpose of the lab. States hypotheses and provides logical reasoning for it.	
	The writing is well organized & structured and contains no mechanical problems (e.g. spelling, grammar, punctuation). References are included where appropriate and are in correct format.	
Methods (4 pts)	Gives enough details to allow for replication of procedure. "Sign post" words are used appropriately. The source of the protocol used for the study is provided with an appropriate reference.	
	The writing is well organized & structured and contains no mechanical problems. Written in paragraph form.	
Results (4 pts)	Provides a summary of the findings in text format. Presents findings visually (tables, figures) as appropriate. Successfully integrates text and visual representations.	
	The writing is well organized & structured and contains no mechanical problems & references are cited appropriately. Format of tables & figures is correct.	
Discussion (5 pts)	Opens with effective statement of support/ rejection of hypothesis. Backs up statement with references to appropriate findings (results). Provides sufficient and logical explanation for the statement. Sufficiently addresses other issues pertinent to lab (possible sources of error, future studies)	
	The writing is well organized & structured and contains no mechanical problems. References are included where appropriate and are in correct format.	
Literature Cited (2 pts)	The references are cited correctly and fully in the CSE name-year format. The correct references are included. http://writing.wisc.edu/Handbook/DocCSE.html	
Format (2 pts)	The report is typed in an appropriate font; section titles are included; pages are numbered	
Appendix (2)	Raw data are included with sufficient detail for the reader to interpret your results. Reader should be convinced that if multiple people collected data, they use standardized methods.	
Final Score with participation adjustment:		

Grading Rubric for Assignment #2 (Lecture): 25 points

***For full credit, each section must be well written and organized in paragraph form, contain no mechanical problems (spelling, grammar, syntax), and cite references appropriately.** In your introduction, specifically address potential reasons why you might expect differences between bacillus and fungal amylase in terms of pH, using the peer-reviewed literature, not your lab manual or your textbook or your professors. What are optimal pH values for amylase from yeast and bacillus? State your hypothesis as a clear expectation based on what you have learned in the peer reviewed literature. State your prediction(s) based on this hypothesis.

Section & Maximum Points	Description of Expectations	Points
Title (0.5 pt)	The concisely conveys what the paper is about.	
Abstract (3 pts)	The abstract contains a well organized and written, concise and complete summary of the paper.	
Introduction (4 pts)	Successfully establishes the scientific concept of the lab by providing clear and complete background information, including motivation for the study (using peer-reviewed citations). Effectively presents the objectives and purpose of the lab. States hypotheses and provides logical reasoning for it.	
Methods (4 pts)	Gives enough details to allow for replication of procedure. These are not instructions, but they are a detailed list of what was done. The source of the protocol used for the study is provided with an appropriate reference. Do not just write, "we followed instructions from Goddard (2013)."	
Results (4 pts)	Provides a summary of the findings in text format. Presents findings visually (tables, figures) as appropriate. You must have at least one figure, and tables and figures must be named (e.g., Figure 1. Results from pH test). Successfully integrates text and Figures; format of tables and figures is correct.	
Discussion (5 pts)	Opens with effective statement of support/ rejection of hypothesis. Backs up statement with references to appropriate findings (results). Provides sufficient and logical explanation for the statement. Uses citations to explain and/or characterize findings. Sufficiently addresses other issues pertinent to lab (possible sources of error, future studies).	
Literature Cited (2 pts)	The references are cited correctly and fully in the CSE name-year format. The correct references are included. http://writing.wisc.edu/Handbook/DocCSE.html	
Format (2.5 pts)	Author names and section number appear at the top of the lab report. The lab report has been emailed to me at jreece@valdosta.edu . The report is typed in 12 pt Times New Roman font; double spaced, 1-inch margins, section titles are included; pages are numbered. Recommended length is 3-5 pages.	
Final Score with participation adjustment:		

Lab Notebook Guidelines

General:

- Your lab notebook should be a ½ wide 3-ring binder notebook that ONLY includes materials from your 1107 lab (do not keep materials from other courses in this notebook).
- Try to keep your lab notebook legible
- You should be thorough in keeping your notes; the entire purpose for a lab notebook is to keep a record of your activities and results so that either you or others reading your lab notebook will be able to replicate your activities. In other words, details are important! If you add 10mL of 0.1 M HCl to 200mL of water, don't write down "added HCl to water", because it would be unclear what concentration the HCl was, how much you added, and how much water you added it to. Your notes should be a full and complete record of your activities in lab.
- We are also going to use your lab notebook for exercises in metacognitive learning. Studies have shown that students have improved understanding and memory when they think explicitly about the learning process. Your lab notebook will be one way in which you formally THINK about how you are learning from lab.
- You will often be working in groups, but each individual's lab notebook should be a stand-alone record of the experiment.
- Number every page
- Every entry begins with the date in MM/DD/YYYY format and the time of day
- Keep a table of contents in the front of your lab notebook that is updated every week
- If you make a mistake, just cross it out; don't remove pages
- Begin each lab on a new sheet of paper

Lab Notebook Format: Follow this format, you will be graded on having an entry for each numbered item in the following guidelines. Some labs may require additional information and sections, but all labs will have the following items unless you are told otherwise. **In bold are things you should fill out before coming to class, the rest you should fill out during lab.**

Introduction:

1. **Date and title, which will be the name of the exercise from your lab manual**
2. **Provide a brief title in your own words (but one that reflects the experiment's name from the lab manual). Use this title in the Table of Contents in your lab notebook**

Purpose/Objectives:

1. **Why are you performing this exercise (not just because Dr. Reece told me to...)?**
2. **What is this exercise supposed to teach you?**
3. **Write down at least two things that you already know about this topic.**
4. **Write down at least one thing that you expect to learn by the end of this experiment.**

Expectations or Predictions:

1. **State a hypothesis or objective for the experiment you will be performing.**
2. **State your expected results or predictions and describe the evidence you used to generate these predictions.**

Materials and Methods:

1. **What is your plan of attack for this lab? Your general outline for completing the lab? (You will write out your specific methods in lab.)**
2. **Write down EVERYTHING YOU DID IN THE ORDER YOU DID IT, NO DETAIL IS TOO MINUTE!**

Results:

1. Record the results of your experiment, including every pertinent detail. Always transfer your group's results to your lab notebook. This includes recreating any tables or graphs from your lab manual in your lab notebook.

Discussion/Conclusions:

1. What was the one most significant thing you learned in the laboratory? Was this what you expected to learn (see Purpose/Objectives #4)? What else did you learn?
2. Explain how the results support or do not support your hypothesis. If you do not understand your results, explain why you cannot explain the results, and what you need to know to be able to explain them. Be specific.
3. What further questions do you have on the subject now that you have finished the exercise? Do the results make you think of any other questions in general about the subject?
4. What further experiments can you suggest to carry out now that you have finished this experiment?

Rubric for Lab Notebooks (25 points total)

-2 points/section (0.5 points for each of the four components of each of 10 sections)

-1 point for Table of contents, 1 point for pages numbered, 3 point for quality of Discussion

1. Exercise 1
 - a. Intro-purpose-expectations
 - b. Methods
 - c. Results
 - d. Discussion
2. Exercise 2
 - a. Intro-purpose-expectations
 - b. Methods
 - c. Results
 - d. Discussion
3. Exercise 3
 - a. Intro-purpose-expectations
 - b. Methods
 - c. Results
 - d. Discussion
4. Exercise 5
 - a. Intro-purpose-expectations
 - b. Methods
 - c. Results
 - d. Discussion
5. Exercise 4 (Lab report/assignment #1)
6. Exercise 6
 - a. Intro-purpose-expectations
 - b. Methods
 - c. Results
 - d. Discussion
7. Exercise 7
 - a. Intro-purpose-expectations
 - b. Methods
 - c. Results
 - d. Discussion
8. Exercise 8 (lab report/assignment #2)
9. Exercise 10 (pass)
10. Mendelian Genetics handout
 - a. Intro-purpose-expectations
 - b. Methods
 - c. Results
 - d. Discussion