

General/Introductory Physics II Lab [PHY 162L/142L] Spring 2008 Syllabus

Instructor

Douglas Young

Instructor Contact Information

Office: Science and Engineering Building [SEB] 244
Phone Number: (478) 301-2704
email: young_dt@mercer.edu
Physics Department Webpage: physics.mercer.edu

Useful Websites

Labwrite Webpage: labwrite.ncsu.edu
Mercer Physics Lab Webpage: physics.mercer.edu/labs/

Instructor Office Hours

Tuesday, Thursday 1:00-2:30

Required Texts

The lab manual can be found on the physics department webpage:

physics.mercer.edu/labs/manuals/manual142162Lab.htm

These labs are viewable on computers in WSC 107 during lab sessions. An additional copy will also be available at each lab station (one copy of the lab instructions per lab station in the room).

Printing of lab instructions in the SEB will not be allowed; students will only be able to print data tables, graphs and lab reports during the lab sessions. Therefore if you wish to have additional paper copies of the lab instructions, you must print them somewhere else ahead of time.

Meeting Rooms and Times

PHY 162L: T 9:25-12:05 SEB 217
PHY 142L: R 9:25-12:05 SEB 217

Corequisites

Introductory Physics II [PHY 142] or General Physics II [PHY 162]

Prerequisites

Introductory Physics I [PHY141], or General Physics I[PHY161], and Basic Physics Lab I [PHY 121L] Students are expected to be able to:

- Read and write at the college level
- Manipulate, and solve, trigonometric, quadratic, polynomial, exponential, and logarithmic expressions
- Be familiar with the experimental basis for kinematics, dynamics, various physical conservation laws, and various thermodynamic properties

Course Objectives

At the end of this course, students will:

- Be familiar with the experimental basis for electromagnetic and optical theories including: Geometric Optics, Electric and Magnetic Fields, the Lorentz Force Law, Faraday's Law, Circuit Theory, Resistance, Capacitance, and RC Circuits.
- Be able to discuss the effects of experimental uncertainty of laboratory measurements.
- Be able to produce and interpret scientific graphs.
- Be able to write conclusions based on the experiments performed and data collected.

Topics Covered

See physics department lab webpage:

physics.mercer.edu/labs/manuals/manual142162Lab.htm

Grading Scale

100	\iff	90	=	A	(4.0)
89	\iff	85	=	B+	(3.5)
84	\iff	80	=	B	(3.0)
79	\iff	75	=	C+	(2.5)
74	\iff	70	=	C	(2.0)
69	\iff	60	=	D	(1.0)
	\iff	≤ 59	=	F	(0.0)

Grading

Weighting

- Quizzes 10 %
- Lab Reports/workshop exercises 90 %

Quizzes

At the beginning of each class period, a quiz over the experiment(s) being conducting that week may be administered. This quiz will last approximately 15 minutes. Students will not be allowed to use the lab manual during the quiz. The primary purpose of the quiz is to encourage students to read and prepare for the experiments being conducted that day.

Lab Report Grading

Students will produce a report on the previous weeks experiment at the beginning of each lab period. This report will consist of the following, as described in the lab guidelines (physics.mercer.edu/labs/guidelines.pdf), unless specified by the instructor:

Quantitative Labs

Most of the labs for this class will be standard quantitative labs in which numerical predictions based on physical theory will be tested experimentally. These labs will be grading using the system described below.

[Data Tables: 5 pts. Total]

- 5pts \Rightarrow Data Tables are filled out neatly and correctly with nothing missing. Includes a set of instructors initials and has reasonable numbers for calculated values, uncertainties, percent errors, and percent variations.
- 4 pts. \Rightarrow Data Tables have one of the following problems:
 - Are messy/hard to read
 - Have odd/unreasonable numbers
 - Are missing something (units, values, etc.)
- 3 pts. \Rightarrow Data tables have any two of the problems listed above.
- 2 pts. \Rightarrow Data tables have all three of the problems listed above.
- 1 pts. \Rightarrow Data tables are missing substantial pieces of information.

[Graphs: 5pts./Graph]

- 5 pts. \Rightarrow Graph has all the required features and is neatly drawn.
- 4 pts. \Rightarrow Graph is messy/hard to read or is missing one of the required features.
- 3 pts \Rightarrow Graph is messy/hard to read and is missing one of the require features, or is missing two of the required features.
- 2 pts. \Rightarrow Graph is messy/hard to read and is missing two of the require features, or is missing three of the required features.
- 1 pts. \Rightarrow Graph is messy/hard to read and is missing three of the require features, or is missing four of the required features.

[Conclusion: 10 pts. Total]

A typed, double spaced conclusion that briefly describes the experiment being performed, discusses the graph produced for the experiment, and discusses the effects of experimental uncertainty in the experiment as outlined in the lab manual.

- 10 pts. \Rightarrow Conclusion is neatly typed with no grammatical/spelling error, flows well, and has all required features.
- 8-9 pts. \Rightarrow Conclusion is messy/hard to read, has minor grammatical/spelling errors, but flows well and has all required features.
- 6-7 pts. \Rightarrow Conclusion does not flow well, or is missing no more than two of the required features.
- 4-5 pts. \Rightarrow Conclusion is missing no more than three of the required features.
- 2-3 pts. \Rightarrow Conclusion is missing no more than four of the required features.
- 1 pt. \Rightarrow Conclusion is missing more than four of the required features.

[Questions: 3 pts./Question]

Answers to specific questions found in the lab manual. These questions should be answered in complete sentences, but can be neatly hand-written.

Inquiry-based Labs

Some labs done during this class will use an inquiry-based format. In this format, students will be presented with a physical situation and asked to make a prediction based on their understanding of the physical system. This prediction must be supported by some kind of reasoning process. This prediction will then be tested experimentally, and the student will draw conclusions based on the correctness or incorrectness of their prediction. Each sub-experiment in the inquiry-based labs will be graded using the rubric shown below.

- Prediction: 2 pts/sub-experiment
What was the prediction that was made about the system?
- Reasoning: 3 pts/sub-experiment
What was the reasoning behind the prediction (i.e. why did you make the prediction that you made)?
- Experimental Result: 3 pts/sub-experiment
Describe the result(s) of the experiment performed.
- Analysis: 3 pts/sub-experiment
 1. If the experiment agreed with you prediction, describe how this(ese) result(s) supports your conclusion(s) and what inference(s) can be draw as a result.
 2. If the experiment did not agree with the prediction, discuss what was wrong with the reasoning that led to the prediction that you made.

Lab Report Policies

- Students may work on the lab write-ups, unless otherwise noted, in groups. Students that prefer to turn in the write-ups individually may do so as well.
- Group effort reports should have a brief statement in the conclusion briefly describing the division of labor. It is expected that students will rotate the responsibilities in generating the reports (i.e. one person should not do the graphing for the whole semester while another writes the same part of the conclusion for the whole semester, etc). The instructor reserves the right to assign a particular part of a lab exercise to a student.
- The instructor reserves the right to revoke the privilege of working in a group if a student (or students) is/are not contributing to the group effort in an equitable manner.
- Students must be present in the lab class and actively participate in collection and analysis of data during the lab class. If a student is absent from class the day an experiment is done, they may not work with their group outside of class and have their work counted as part of the group effort.

Pre/Post Assessment Testing

During the first/last lab sessions, students will complete a Pre-/Post-test assessment. Your SCORE on the PRE-TEST will not affect your grade in the course. For each test, the following information **must** be included on the scantron sheets:

- Student Name
- Mercer Student ID (with bubbles filled in correctly)
- Lecture Course (e.g., 141)
- Semester (e.g. Fall 2007)
- Answers to ALL the test questions

Completing each assessment test will count as one lab quiz grade. Failing to include one of the items mentioned about on the assessment test will result in a grade of 70 for the lab period. Failure to include more than one item will result it a lab quiz grade of 0 for the lab period.

The POST-TEST cannot reduce your final grade (except for the same reason as the Pre-test, indicated above), BUT depending on the SCORE you achieve, it can improve your grade as follows:

- Less than 50% – no bonus
- 50% to 59% – +1% to final lab grade
- 60% to 69% – +2% to final lab grade
- 70% to 79% – +3% to final lab grade
- 80% to 100% – +4% to final lab grade

Class Policies

- The instructor reserves the right to modify this syllabus as deemed necessary any time during the semester. Emendations to the syllabus will be discussed and negotiated with students during a class period. A revised syllabus which supercedes the original document will then be handed out in a class period shortly after the discussion/negotiation class period.
- Students are responsible for all information discussed in class. Be forewarned that students with more than an occasional absence risk doing poorly.
- Any difficulties within a group should be reported to the instructor. It is expected that students will treat each other with courtesy and respect. Racial and gender slurs will not be tolerated.
- Questions about points awarded on lab work should be brought up as soon as these materials are handed back to students. All grades are final four weeks after the lab work has been handed back.
- No makeup quizzes will be administered. Students that come in late to class will be given a zero on the quiz for that day, unless the student has a good excuse. Excused absences should be discussed with the instructor as soon as possible.
- Students are expected to pick up after themselves before leaving class. Five points will be deducted from a lab report for leaving the equipment in a state of disarray. An additional five points will be deducted for further infractions.
- ***Lab data must be initialed by the instructor before students leave.*** Any lab reports turned in without these initials will not be graded.
- Missed lab work must be made up within the same week of the lab exercise. If a student knows in advance that a lab period will be missed, it is expected that the student will discuss a makeup time beforehand.
- The College of Liberal Art's academic policy will be followed. The Mercer University Honor Code binds all students. Any student caught cheating will be brought before the Honor Council. As stated in the Honor Code, "It is the responsibility of the student to ascertain what would constitute a violation of the Honor Code in any given situation. One (the student) has an additional responsibility to understand fully a professor's position in special situations which may be present in his or her course. Ignorance of a professor's expressed class policy is not an excuse for an Honor Code violation." In other words, if in doubt, come see me.
- Students with a documented disability should inform the instructor at the close of the first class meeting. The instructor will refer you to the office of Student Support Services (SSS) for consultation regarding evaluation, documentation of your disability, and recommendations for accommodation, if needed. Students will receive from SSS the Faculty Accommodation Form. On this form SSS will identify reasonable accommodations for this class. The form must be given to the course instructor for signature and then returned to SSS.

- To take full advantage of disability services, it is recommended that students contact the Office of Student Support Services, immediately. The office is located on the third floor of the Connell Student Center.