Lab Syllabus

Course Requirements

Co-requisite: PHYS 1112 Lecture

Text: Phys 1112L Coursepack
http://depts.gpc.edu/~dunpslb/1112L/

Other Materials: Scientific Calculator;
Quad ruled laboratory notebook;
Centimeter graph paper

Instructor & Section Information: See attached addendum.

General Information

This course is a sequence of experiments and laboratory projects that complements the Introductory Physics I lecture course. In the laboratory you will:

• Observe and measure the physical phenomena discussed in the lecture;
• Confirm the experimental results upon which physics theory is based;
• Develop scientific measurement and analysis skills;
• Practice applying physics principles to physical phenomena;
• Develop scientific report writing skills.

The course consists of 14 laboratory sessions. These include:

• an orientation or introductory session;
• 11 experiment laboratories;
• a midterm test/assignment;
• a final exam.

See the attached schedule for laboratory titles and dates.

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Student Responsibilities

- Read this syllabus.
- Read the *GPC Laboratory Safety Guidelines* and sign and submit the *Lab Safety Contract* sheet by the 2nd laboratory session. In addition, you must complete the *Lab Safety Quiz* with a score of 100%. These documents will be posted in the iCollege section for your lab course. They are also available at the lab website: [http://depts.gpc.edu/~dunpslb/1112L/](http://depts.gpc.edu/~dunpslb/1112L/)
- Arrive on time for and attend each scheduled lab session. (You are allowed one drop; and see below for possible make-up sessions.)
- Cease all conversation or activity during the pre-lab lecture. You must be present for the pre-lab lecture and may not begin lab work before this is complete.
- Treat all equipment and facilities with care and return experiment apparatus as you found it when done. *Leaving equipment in an unsafe or disorganized state (disorganized is unsafe) is grounds for a zero grade for that lab.*
- Maintain a laboratory notebook, in which you record all experimental data.
- Participate actively in each experiment. In no case may you use data collected by someone else.
- Refrain from all academic dishonesty. *Copying of lab work, pre-lab work or lab reports is grounds for dismissal from the course with a grade of failing.*

Preparation

- Before each lab, read the relevant course-pack section. Read the introductory section of the course-pack before the second lab session (which will be the first experiment session).
- Go to the lab website: [http://depts.gpc.edu/~dunpslb](http://depts.gpc.edu/~dunpslb) for information on notebook and lab report requirements and for notes on specific experiments.
- Perform the relevant pre-lab worksheet, and have it ready to turn in at the beginning of the lab. You are to work on the pre-labs individually, not in groups. The pre-labs are designed to clarify your thinking about the issues you will encounter in your lab work. All questions in the pre-labs can be answered by referring to the course-pack.
- Review your lecture notes or text concerning the subject of the experiment. However, you will often perform experiments before your lecture course discusses a particular subject. This is normal, and is no obstacle to performing an experiment.
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Performing the lab

- Team up with a lab partner and go to one of the prepared experiment stations. **Students will work in groups of two, except when instructed otherwise by the lab instructor.** Put book bags under the lab table or in a book-bag cabinet.
- Set up a section in your lab notebook for data-taking. That is, title a section for the current lab, date the pages, and draw up the necessary data tables. It is best to do this as you do the lab, as a good format may not be evident until you see the equipment and understand what data are necessary. You can be guided in this by the data tables in your lab text (course-pack), but the tables in your text are for you to turn in as part of your report. The data tables in your notebook are for you to keep as a record of your work. **All data must be authenticated (initialed) by your lab instructor at the end of the lab.**
- Follow the instructions in the lab manual step-by-step. Before beginning, briefly look over all the instructions to get an overview of what you are going to do, so that you can pace yourself.
- Take all measurements carefully. **Accuracy and precision** count, and show up in your results.
- Before packing up your equipment, perform some example calculations to make sure your data are reasonable, and that you have made all necessary measurements.
- When finished, turn off all instruments, break down your set-up and store all equipment as you found it. Tidy your station. If you have finished all necessary work, you may leave.

Lab Report

For each experiment, you will turn in a Lab Report at a time specified by your instructor. Most reports will be informal. At least two reports will be formal.

- **Informal lab report:** Compile the data and calculations from your lab notebook, along with other required calculations and analysis, into an electronic document to be submitted through the iCollege dropbox. A general format for these reports is as follows:
  1. Objective
  2. Method
  3. Data
  4. Calculations & Analysis

- **Formal lab report:** These will be formal write-ups of selected experiments, where you will explain the idea and theory of the experiment and describe
your calculations, graphs, analysis and conclusions. Your instructor will specify whether these should be written in your lab notebook or as separate submissions. Examples, with formatting requirements, are posted on the lab web site.

Lab partners may collaborate in the preparation of the lab report, but each student’s report must be his or her own work. This means the report must be written in each student’s own words and the calculations must be done by each student’s own hand. Note carefully the Academic Honesty Policy (below).

Lab reports will be assessed on the following criteria:

1. Experiment
   - Correct procedures
   - Precision & accuracy in measurement
   - Neatness and organization of data
   - Participation

2. Data Analysis
   - Correct calculations
   - Significant figures & units
   - Graphing & other analysis

Grading

Students must complete and report on a minimum of 10 experiments to qualify for a grade in this course. The student’s grade will be based on the following point spread/percentages:

<table>
<thead>
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<th>Percent</th>
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<tbody>
<tr>
<td>1. 10 lab reports @7 pts</td>
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<tr>
<td>2. Pre-Lab assignments/quizzes</td>
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<tr>
<td>3. Midterm test or assignment</td>
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<td>4. Final Exam</td>
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The student’s letter grade is based on the following scale:

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A  90% or above
B  80%-89%
C  70%-79%
D  60%-69%
F  below 60%

Lab Final Exam

The lab final exam will be held in the lab room on the last regularly scheduled lab date, at the regularly scheduled lab time. See addendum for the date and time for your section.

Part or all of the final exam will be written and will test the following skills:

- Handling & interpreting experimental data
- Data and error analysis
- Setting up & using graphs
- Principles used in specific experiments

Part of the final exam may be practical, where the assignment is to determine some quantity experimentally. This will test your ability to use the principles involved in specific experiments.

The exam will cover all material covered in the course. Make-up examinations will be given only in the case of verifiable emergencies. If you know that you will not be able to take the exam on the specified date, make arrangements in advance.

Attendance Policies

Students who are on the official class roll must sign an attendance sheet each lab session. The college requires that attendance records be maintained for each lab period.

Students who are not on the class roll may not attend the lab. Instructors are required to monitor the current status of the class roll and deny entry to any student whose name does not appear on the roll, as maintained by the registrar.

Students who have never attended after the end of the first two weeks of the semester will be reported to the registrar as “no shows” and will be automatically dropped from the class roll.

Students may drop one experiment lab session without penalty. One other missed lab may be made up in the case of a verifiable emergency or other legitimate, unforeseen circumstance. (See OPEN LAB on the lab website.) However, students are responsible for all information presented during any meeting.

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Tardiness Policy

Students may be refused entry if they arrive late. In no case may a student use data collected by someone else.

Withdrawal Policy

A student who wishes to withdraw is responsible for completing a withdrawal form through the registrar, by the withdrawal date listed in the Schedule of Classes.

Any student who withdraws from a lecture must also withdraw from the lab. Likewise, any student who withdraws from a lab must also withdraw from the lecture.

Incomplete

An incomplete grade will be given only when a student in good standing is prevented from taking the final exam by circumstances beyond his/her control; e.g., hospitalization, death in the family, or other similar cause. To obtain a grade of “I”, you must submit a Request for Incompletion form to the Chair of the Department of Physical Sciences.

Inclement Weather Policy

In case of school closing because of bad weather or other emergency, a make-up date or dates will be scheduled by the Science Department. If this is not feasible, then the last experiment(s) in the schedule will not be presented; students will be graded on their best labs (with the worst score dropped) and the grading schedule adjusted accordingly. In any case, we will proceed with the sequence of labs as detailed in the lab schedule.

Student Behavior

The instructor has the right to exclude a student or group of students from class if found disruptive. Unsafe behavior, such as horseplay, argumentative or hostile behavior, excessive talking and outbursts are considered disruptive.

Academic Honesty Policy - Cheating and Plagiarism:

Cheating is contrary to the policy of Georgia Perimeter College. Cheating includes any attempt to defraud, deceive, or mislead the instructor in arriving at an honest grade assessment. Plagiarism is a form of cheating that involves presenting as one's own ideas the ideas or work of another.

All portions of any test, project or final exam submitted by you for a grade must be your own work unless you are instructed to work collaboratively. Specific requirements will be described for collaborative projects, but all work presented must be the work of members of the group. Research materials used must be properly cited.

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Violation of the Academic Honesty policy will result in a grade of a “zero” for that test, project or exam. A second offense will result in an assignment of a grade of “F” for the course and a formal charge of Academic Dishonesty will be lodged with the Campus Dean for Student Services.

Policies have been established by Georgia Perimeter College to ensure due process in charges of cheating or plagiarism. A copy of these procedures can be found in the Student Handbook.

Lab Website: http://depts.gpc.edu/~dunpslb

This site contains the lab schedules and other information about performing the labs and filing a report. You may sign up for an OPEN LAB session here.

Common Course Outline Information

Course Objectives

This course complements PHYS 1112 by giving the student practical experience in the study of electricity, magnetism and optics. Principles discussed in the lecture course will be physically demonstrated in the laboratory by studying the characteristics of electric circuits and the behavior of light. In addition, students will be introduced to the methodology of experimental work, data analysis.

Expected Educational Results

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

1. Perform basic measurements and collect data as are deemed appropriate by the experiments performed.
2. Graphically present and analyze data. Deduce valid conclusions from this analysis.
3. Analyze an experiment for sources of error and suggest possible corrections and improvements.
4. Write a lab report.
5. Discuss the theoretical basis of the performed experiments in the terms described by the corresponding complementary lecture.

General Education Outcomes:

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- Students will develop communications skills by reading the text and other laboratory materials, through discussions with lab partners and the instructor, and by preparing and writing laboratory reports.
- Students develop problem solving and critical thinking skills through performing experiments, analyzing results, and completing pre- and post-lab assignments.
- Students recognize and apply scientific inquiry by performing experiments and recognizing the conceptual and physical models of phenomena. Data is collected, analyzed and compared with theories presented in lectures.

Americans with Disabilities Statement

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

Statement of Non-Discrimination

Georgia Perimeter College supports the Civil Rights Act of 1964, Executive Order #11246, Title IX of the Educational Amendments of 1972, Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act. No person shall, on the grounds of race, color, sex, religion, creed, national origin, age, sexual orientation 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 Georgia Perimeter College.

Any individual with a grievance related to the enforcement of any of the above provisions should contact the Assistant Director of Human Resources, Ombudsperson.

Affirmative Action

Georgia Perimeter College adheres to affirmative action policies designed to promote diversity and equal opportunity for all faculty and students.

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Lab Schedule

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<th>Session</th>
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<tr>
<td>1</td>
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<td>Introduction: Simple Circuits</td>
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<td>2</td>
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<td>Electrical Measurements</td>
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<td>3</td>
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<td>Electric Fields</td>
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<td>4</td>
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<td>Ohms Law</td>
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<td>5</td>
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<td>DC Circuits</td>
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<td>6</td>
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<td>RC Circuits</td>
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<td>7</td>
<td></td>
<td>Midterm</td>
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<td>8</td>
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<td>The Current Balance</td>
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<td>9</td>
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<td>LRC Circuits</td>
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<td>10</td>
<td></td>
<td>Geometric Optics</td>
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<td>11</td>
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<td>Lenses and Mirrors</td>
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<td>12</td>
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<td>Interference &amp; Diffraction</td>
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<td>13</td>
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<td>Grating Spectrometer</td>
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<td>14</td>
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<td>Final Exam</td>
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Instructor Information

Name:

Office:

Phone:

Email:

Office hours:

Section Information

Term:

Section:

Room:

Time:

Final Exam:
(Date & Time)