Physics 221 – 019: Elements of Physics Lab

Fall 2011

Instructor: Cory Thornsberry

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Office Hours: PHY 201 Tue 2:20 – 3:30

Meeting Times: Friday

Recitation: PHY 608 12:20 – 1:10pm

Lab: PHY 508 1:25 – 3:20pm

Required Text:

“Contemporary Introductory Physics Experiments” by James E. Parks

ISBN: 978-0-7380-3083-8, Available at the UT Bookstore and Supply Store

Grading Policy:

70% Lab Reports
20% Quizzes
10% Participation & Attendance

Structure:

Recitation: This is your chance to ask any questions you may have over material covered in lecture. Make sure you bring your text book and any homework problems your lecture instructor has assigned, so that we can go over problems you need help on. This is a time where we can discuss, in further detail, ways to solve problems presented to you in class.

Lab: In the lab portion of the class, you will perform real-world demonstrations of physics principles you learned in class. Each lab will deal with some physical law that you will attempt to verify with actual data.
Grades:

Lab Reports: Lab reports are due at the beginning of the next recitation. Late work will incur a 10% penalty every day that it is late, up to the maximum of five (5) class days (not weekends). If you turn in a lab report after five class days have passed, you will automatically receive a zero for that lab. You may only miss one (1) lab during the semester and be able to make it up. The lab make-up day is scheduled for November 29th 2011. Let me know, if you plan to use the make-up day. If you miss more than one day, you will receive an automatic zero for that lab. Each student is responsible for turning in an individual lab report.

Quizzes: Quizzes will be given at the end of every recitation session. The quizzes will be composed of several multiple choice questions over the material we covered in the previous session. If you miss a quiz, you cannot make it up. However, I will drop your lowest quiz grade at the end of the semester.

Attendance:

The lab and recitation sections are very important for your understanding of the material that is covered in lecture. Therefore, attendance is mandatory for this class. To encourage you to show up on time, I will take attendance within the first 5-10 minutes of recitation. If you are not there at that time, you will receive no credit for attendance or participation on that day. If you miss a lab session, I will not accept a report for that lab. You cannot use the data your group collected if you missed the lab.

Honesty:

Use the data collected by your group only. If you know that your data is unreasonable do not copy data from another group. Instead, if you have time, try to retake the data in an attempt to obtain better results. If that fails, include in your lab report a discussion on why you think the data is flawed. The object of the lab is not to obtain perfect data; it is to see whether or not you understand what is going on.

Lab Report Layout:

These are the main points I will expect each of your lab reports to contain. Since you will have an entire week to finish the lab reports before they are due, I will expect your work to be typed (I will count off for hand written work). It doesn’t matter which program you use to write your report just make sure you use a reasonable font and size. It would be beneficial for you to use an equation editor of some kind, although I will not count off for this. Each lab is worth 100 points.

1) Title (5 points):
   a. Experiment name
   b. Your name and group number
   c. Date and lab section number
2) Objective (5 points):
   a. Describe, in your own words, what the lab is about. That is, discuss what you’re trying to find or to show. Don’t copy out of the lab manual, I can read the lab manual for myself.

3) Procedure (20 points):
   a. Briefly explain what you did in the experiment. I’m not looking for a copy of the lab manual. Instead, describe why you did what you did.
   b. Include all relevant equations. Make sure to label all your variables and units.

4) Data (30 points):
   a. This is where you will include the actual data you recorded in the lab. I expect the data to be neatly formatted and easy to read. If you use tables, make sure to label your columns and rows. If you use charts, make sure to label the coordinate axes and include units. A chart or table without units is useless.
   b. This is also where you will include your error analysis (the percent difference from a known value, for example).

5) Conclusion (30 points):
   a. This is where you will prove that you know what you’re talking about. Discuss the reason for doing this experiment (why should anyone care?). Discuss what you found. Did your results agree with the expected values? What are some of the sources for systematic and random errors? Do you feel that you were successful with your experiment?

6) Questions/Other (10 points):
   a. I will tell you which questions from the lab manual (if any) to include.
   b. Instead of questions, I may ask you to add something else to your report. You will add any extra information in this section.

**Lab Schedule:**

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<thead>
<tr>
<th>Date</th>
<th>Experiment</th>
<th>Date</th>
<th>Experiment</th>
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<tbody>
<tr>
<td>Aug 26</td>
<td>Acceleration Due to Gravity</td>
<td>Oct. 21</td>
<td>Mechanical Equivalent of Heat</td>
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<tr>
<td>Sept 2</td>
<td>The Force Table</td>
<td>Oct. 28</td>
<td>Simple Harmonic Motion</td>
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<td>Sept 9</td>
<td>Conservation of Mechanical Energy</td>
<td>Nov.  4</td>
<td>Standing Waves I &amp; II</td>
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<td>Sept 16</td>
<td>Conservation of Linear Momentum</td>
<td>Nov. 11</td>
<td>Refraction</td>
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<td>Sept 23</td>
<td>Centripetal Acceleration</td>
<td>Nov. 18</td>
<td>Simple Lenses</td>
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<td>Oct 7</td>
<td>Boyle’s Law</td>
<td>Nov. 29</td>
<td>Makeup lab</td>
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<td>Oct 14</td>
<td>Heat of Fusion of Ice</td>
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**Disability Services:**

If you need course adaptations or accommodations because of a documented disability, please contact the Office of Disability Services (ODS). This will ensure that you are properly registered for the services provided by ODS.