Physics 221  Section 6,  Fall 2011

**Recitation:**  Tuesday 11:15 – 13:10 PM  Physics 608

**Laboratory:**  Tuesday 10:10 – 11:00 PM  Physics 508

**Instructor:**
Archil Garishvili

**E-mail:**  agarishv@utk.edu

**Office:**  217 (Nielsen Physics building)

**Working hours:**  Tuesday  1:30 – 3:30 PM

Thursday  3:30 – 5:30 PM

And by appointment.

Cell – 865 206 1325

**Books:**  Contemporary Introductory Physics Experiments – James E. Parks

College Physics - Serway/Vuille, Eighth Edition

**Purpose of the Lab:**

The purpose of this laboratory is to give you some direct experience with the concepts that you will learn in the lecture portions of this course. In addition, you will be exposed to the techniques that are used to obtain and analyze the experimental data, which are used to construct or test physical theories.

**Recitation Assignment:**

The purpose of the recitation is to give you a chance to go over what you want to. I will prepare some practice questions, but the recitation should be driven by your
discussion/questions. There will be a short quiz at the beginning or the end of the recitation session, and you are expected to be prepared for these quizzes. They cannot be made up. Books must be closed. However, since I expect lots of feedback during the recitation section, if we go over something and everyone says they understand it, I may give a quiz on that material. I expect you to make it clear if you don’t understand something so we can use class time effectively. After each quiz, we will work on your specific questions if there are any; otherwise, I will work on some problems or concepts, which are related to the course material and/or your assignments.

**Laboratory Assignment:**

You are expected to read the experiment before coming to the lab session. Generally, you will work in pairs while performing experiments; however, both partners will collaborate in filling out the data sheet. At the end of the lab, the data sheets can be printed out and attached to the reports that must be written *individually*. Reports or homework assignments are due at the beginning of each recitation period. If it is passed in anytime after that, on the same day, I will deduct 10%. If you pass it in anytime between the end of the day and the next lab period you will lose 50%. No credit will be given to lab reports passed in more than a week late.

I expect both lab partners to be able to use excel and perform the lab, so you should make sure you are comfortable with each aspect of the lab.

**Lab Reports**

Lab report should contain the following information:

1) **Title section** This section should include:
   a) Your name
   b) Your partner’s name(s)
   c) Title of the experiment as written in the lab manual or on the lab schedule
   d) Date of the experiment (The date should be the date the experiment was performed, not the date turned in!)
2) **Procedure and method section** is worth approximately 25 points. This section should include:
   a) The title “Procedure”
   b) One or two sentences describing the general purpose of the experiment. For example, “The purpose of this experiment was to measure the acceleration due to gravity, g.”
   c) A description in your own words of how the experiment was performed.
   d) A description of what data was recorded and how it was used. For example, “Time for the car to pass through the first photogate was recorded to find the car’s initial velocity.”

The procedure section should be in depth enough so a person who has not read the lab manual could understand your experiment and repeat your findings. However, this section should not be so in depth that it overwhelms the reader with useless information. (An example of useless information would be, “The time elapsed was entered into cell C3 in the Excel spreadsheet.”)

Write professionally and avoid complaining or talking about your feelings. For example, don’t say “I had fun.” or “I learned a lot from this experiment.” It is however okay to say something like “Next, we used the conservation of momentum to calculate…”.

Lastly, copying and pasting the lab manual or Wikipedia is plagiarism. This will be addressed as cheating and you will be reported for academic dishonesty. This section should be between a quarter page and half a page and should not be more than a page in length.

3) **Data Analysis** will be worth approximately 25 points and should include:
   a) The title “Data Analysis”
   b) Formulas you used during the experiment to produce numbers in the tables in the data section. Write your formulas as you would see them in a physics or math book, not as you would type them in Excel. (Write F=ma, not D3=A$1*B2)
   c) A mathematical description of your analysis. For example, in the procedure section, part d, it says “Time for the car to pass through the first photogate was recorded to find the car’s initial velocity.” In this section you would
write the specific formula used to find the car’s velocity, \( v = \frac{d}{t} \), and how it was used.

d) Definition of all the variables in the formula as they apply to the experiment. For example “\( v_i \)” should be described as “the initial velocity of the car” not just “velocity”.

4) **Conclusion with Error Analysis section** will be worth approximately 25 points and should include:

a) The title “Conclusion with Error Analysis”
b) The final result of the experiment. “We measured the acceleration due to gravity, \( g \), to be 9.71 m/s^2.”
c) The percent error found in the experiment or a discussion on how the results agreed or disagreed with the accepted values or your intuition
d) A discussion about any likely errors that occurred and why they happened or a discussion about any conclusions you drew. Don’t use the following excuses for a high percent error: “human error”, miscalculations in excel, misentering of data, etc. I want you to talk about the physics of what is going on. Discuss how energy was lost through other means and why your values reflect this. This section should be between a quarter page to half a page and should not be more than a page in length.

**Schedule of Laboratories:**

<table>
<thead>
<tr>
<th>Dates (Tuesday)</th>
<th>Experiment</th>
</tr>
</thead>
<tbody>
<tr>
<td>23-aug</td>
<td>Gravity due to acceleration</td>
</tr>
<tr>
<td>30-aug</td>
<td>The force table</td>
</tr>
<tr>
<td>6-sep</td>
<td>Conservation of mechanical energy</td>
</tr>
<tr>
<td>13-sep</td>
<td>Conservation of linear motion</td>
</tr>
<tr>
<td>20-sep</td>
<td>Centripetal acceleration</td>
</tr>
<tr>
<td>27-sep</td>
<td>No lab</td>
</tr>
<tr>
<td>4-oct</td>
<td>Boyle’s law</td>
</tr>
<tr>
<td>11-oct</td>
<td>Heat of fusion of ice</td>
</tr>
<tr>
<td>18-oct</td>
<td>Mechanical equivalent of heat</td>
</tr>
<tr>
<td>25-oct</td>
<td>The simple pendulum</td>
</tr>
<tr>
<td>1-nov</td>
<td>Standing waves</td>
</tr>
<tr>
<td>8-nov</td>
<td>Refraction of light</td>
</tr>
<tr>
<td>15-nov</td>
<td>Lenses</td>
</tr>
<tr>
<td>22-25nov</td>
<td>No lab this week</td>
</tr>
<tr>
<td>29 Nov</td>
<td>Makeup’s</td>
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</tbody>
</table>
Attendance:

It is expected that you attend every recitation and laboratory.

Grading:

Lab reports: 70%
Quizzes: 20%
Attendance: 10%

According to Professor Efremenko, all labs should be completed, in order to pass this course!

Students with Disabilities:

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 the ODS.

Office of Disability Services

2227 Dunford Hall
Knoxville, TN 37996
Phone: 865-974-6087

Academic Dishonesty

Academic dishonesty will not be tolerated, and any incidents will result in a failure of that assignment and a referral to Professor Efremenko.