PHSX 218N.02: Physics Lab II with Calculus

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Overview: The goal of this class is to give you a sound introduction to classical experimental physics. This will include studying some basic concepts in physics, development of problem solving skills, and learning of laboratory techniques. It is essential that you keep up from the start as the concepts in this course build on each other. Co-requisite to this course is PHSX 217.

Learning Objectives: The goals of this course are:

1. To learn how to properly take measurements and record data.
2. To learn how to interpret results both statistically and graphically.
3. To experimentally confirm theories presented in lecture.

Laboratory: There will be 12 two-hour labs during the semester. 11 of those labs will count towards your final grade. You will be required to attend the labs, take measurements, and then write up a report or take a quiz for each lab. Each student must hand in their own lab report written in their own words (no duplicates!)

In preparation for the course, you should go to the course web site to download two documents: (1) Laboratory Report Guide, which gives instructions on what to include in the lab report and how to present your results; and (2) Errors and the Treatment of Data, which explains how to handle error analysis, graphing, and other key issues that come up while writing labs. Each week, a few days before your lab, you should download and print a copy of the current lab, read it and bring it with you to your lab meeting. Students are expected to have read the instructions prior to arriving at the lab, and will be asked to take a brief pre-lab quiz. Labs are held Wed 3:10-5:00 pm, or Thurs 3:10-5:00 pm in room CHCB 229. Lab Reports are due at the beginning of the next lab meeting. The last lab report is due May 2 at 5:00 pm, absolutely no labs will be accepted after this date. Some labs will have quizzes instead of lab reports. See below for when these quizzes are due. There will be no make-up labs; if you miss your lab, contact your instructor about attending another section that week.

When things are due:
Pre Lab Quizzes: On Moodle, open Friday at 8am and close at 11:55pm the day before your lab section. 60 min allowed to take quiz
Lab Quizzes: On Moodle, open Friday at 8am and close on Monday at 11:55pm for all sections.
Lab Reports: Due at beginning of the following lab meeting.
Late Penalties for Lab Reports:
0-1 day 5%, 1-2 days 10%, 2-3 days 15% , 3-4 days 20%, 4-5 days 25%
More than 5 days past due, we will no longer be able to accept it.

Grading:
Laboratory Write-ups and Quizzes: 80%
Pre-laboratory Quizzes: 20%

This course can be taken for a traditional letter grade only:
A or A−=90%-100%, B+, B, or B-=80%-89%, C+, C, or C-=70%-79%, D+, D, or D-=60%-69%,
F=59% or less

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code. The Code is available for review online at www.umt.edu/SA/VPSA/index.cfm/page/1321.

Accommodations: Students with disabilities may request reasonable modifications by contacting me. The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). "Reasonable" means the University permits no fundamental alterations of academic standards or retroactive modifications. For more information, please consult http://life.umt.edu/dss/
## Physics 218: Spring 2014 Schedule

<table>
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<tr>
<th>Week</th>
<th>Labs</th>
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| Week 1 | Jan 27–Jan 31    | Review and more Python  
                     | Quiz: Review and more Python |
| Week 2 | Feb 3–Feb 7     | Experiment: Thermal Expansion  
                     | Report: Thermal Expansion |
| Week 3 | Feb 10–14      | Report Due: Thermal Expansion  
                     | Experiment: Mechanical Equivalent of Heat  
                     | Quiz: Mechanical Equivalent of Heat |
| Week 4 | Feb 17–21      | NO LAB |
| Week 5 | Feb 24–Feb 28  | Experiment: Electric Fields  
                     | Quiz: Electric Fields |
| Week 6 | Mar 3–Mar 7    | Experiment: Ohm’s Law and Simple Circuits  
                     | Quiz: Ohm’s Law and Simple Circuits |
| Week 7 | Mar 10–14      | Experiment: Slow RC  
                     | Quiz: Slow RC |
| Week 8 | Mar 17–21      | Experiment: Fast RC  
                     | Quiz: Fast RC |
| Week 9 | Mar 24–28      | Experiment: Magnetic Force  
                     | Report: Magnetic Force |
| Week 10| Mar 31–Apr 4   | NO LAB: Spring Break |
| Week 11| Apr 7–11       | Report Due: Magnetic Force  
                     | Experiment: Magnetic Induction  
                     | Quiz: Magnetic Induction |
| Week 12| Apr 14–18     | Experiment: Raspberry Pi  
                     | Quiz: Raspberry Pi |
| Week 13| Apr 21-25     | Experiment: Index of Refraction  
                     | Report: Index of Refraction |
| Week 14| Apr 28–May 2   | Report Due: Index of Refraction  
                     | Experiment: Lenses  
                     | Quiz: Lenses |
| Week 15| May 5–9       | Experiment: Interference  
                     | Quiz: Interference |
| Week 16| May 12–16     | Finals Week NO LAB |