

1-2014

PHSX 208N.02: College Physics II Laboratory

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Recommended Citation

Halfpap, Braford L., "PHSX 208N.02: College Physics II Laboratory" (2014). *Syllabi*. 979.
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Physics 208

Laboratories to accompany Physics 207

Syllabus

Getting in touch with me

Office: Room 121 in the Clapp Building

Office-

| | | |
|--------|-----------|---------------|
| Hours: | Monday | 11:00 to noon |
| | Wednesday | 3:00 to 4:00 |
| | Thursday | 8:30 to 9:30 |

Email: You can email me at bradford.halfpap@umontana.edu.

Phone: I do have a telephone in my office; the number is 243-6237. However, email is a better way to reach me.

The Course

You should become familiar with the Moodle site for this class as you will find the laboratory handouts there for each week. You are expected to bring a copy of the handout for each week and your lab notebook with you to each lab meeting. There are additional materials posted there as well.

I have four learning goals for the laboratory course.

1. *I want you to learn to make careful and correct measurements in the laboratory.* This means that you are to measure the indicated quantities with the appropriate instruments - *using them well*. If you do this you will get very nearly the measurement I did when I used the same equipment to investigate the same questions. I will assess this with one or more questions on lab quizzes asking for your measurement result. You will give your measurement with an associated uncertainty. Your score will reflect how well you used your measurement tools and whether you present your results appropriately.
2. *I want you to learn to perform appropriate analyses of your data.* I will explain how you might do this for each week's laboratory exercise. As examples, you might do a statistical analysis or perhaps a graphical analysis. I will assess this by asking for intermediate or final results on your lab quiz. Your score will reflect how well you did your computations.
3. *I want you to be able to understand and use simplified error analysis techniques.* You should be adept at this from your work in Physics 206. I will ask you for your uncertainties in intermediate or final computations on your lab quizzes. Correct use of our analysis scheme will get you full credit. We will make extensive use of spreadsheets. You need to have a reasonable facility with EXCEL.
4. *I will want you to understand the physical implications of some of the major concepts featured in the laboratory exercises.* We will discuss some of these during the introduction to the labs but I will expect you to be able to think and apply your knowledge on the spot. Most weeks there will be a question to assess this on your lab quiz.

Course Grades

There are 11 laboratory exercises; for each there will be a pre-lab quiz and a post-lab quiz. There will be no opportunities for make up labs.

Pre-Lab Quizzes

At 8:00am on the Thursday prior to your laboratory meeting a Pre-Lab Quiz will become available on our Moodle site. You will have until 11:00pm on Sunday to have completed the Pre-Lab Quiz. There will be 11 such quizzes and your grade will, in part, be based upon your best 9 scores. There will be no late or make-up quizzes. Each Pre-Lab Quiz will require you to do computations similar to the questions asked in the laboratory handout.

- Work through the handout before starting the quiz.
- Keep at least 4 digits during your computations.
- Read the questions carefully and answer the question that was asked.
- All questions will either be multiple choice or require a numerical value as an answer.
- Units will be a required part of most answers. 100% of the time you will be required to use standard SI units (m, kg, s, J, N, etc.). If you use non-standard units (g, cm, mm, km, etc.) you will lose that part of the credit. Just use the standard units throughout the entire semester.
- You will have 30 minutes to complete the quiz but it is designed to be completed in 10 minutes by a well prepared student.
- Laboratory meets on Monday and Tuesday after Spring Break. You will need to get your preparation and quiz done before you leave town; plan ahead!

Post-Lab Quizzes

At 8:00am on the Thursday following your laboratory meeting a Post-Lab Quiz will become available on our Moodle site. You will have until 11:00pm on Sunday to have completed the Post-Lab Quiz. There will be 11 such quizzes and your grade will, in part, be based upon your best 9 scores. There will be no late or make-up quizzes.

- Each quiz will follow the same format. There will be one (possibly multi-part) question at assess each of the four learning goals listed above.
- For some laboratories you might be asked to submit a graph in EXCEL or pdf format. If this is to be the case you will be informed in the handout for that laboratory so that you can be prepared to upload that file.
- For measurement questions credit will be given based upon how well you made your measurement. Pay attention to the units requested; being off by a factor of 10 or 1000 will surely result in zero points for that question.
- For questions regarding uncertainties it will be possible for you to give values that are too large or too small. Pay careful attention to what you are actually doing during the laboratory period and make notes in your book.
- There will be a range of acceptable values for computed results. The range is not without limit though. Typically you will need to be within about 20% to receive full marks however this can vary significantly for particular laboratories.
- If you have done your analysis in a thoughtful fashion you should be well prepared to answer the application problem. It is usually inspired by the calculations that you were to have done.
- Each quiz will be designed to be finished in not more than 15 minutes by a well prepared student. You will have 45 minutes from the time you start to complete the quiz.
- You need to plan ahead for Spring Break. I suggest you do your analysis for the Magnetic Forces laboratory right away and then take the quiz on Thursday. Regardless, the quiz must be done by 11:00pm on the **first** Sunday of break.

The Pre-Lab Quizzes will count for 20% of the semester grade. The Post-Lab Quizzes will constitute the remaining 80%. The distribution of grades across any instructor's sections will, by departmental policy, be about 25% A, 25% B, 25% C, and 25% D & F. All students who complete the first two weeks will be counted in this total and thus some of the D and F grades will be associated with students who have withdrawn from the course.

| Laboratory Date (Monday) | Nature of Laboratory |
|--------------------------|-------------------------------------|
| Jan 27, 2014 | No Meeting |
| Feb 3, 2014 | No Meeting |
| Feb 10, 2014 | Electric Field and Potential |
| Feb 17, 2014 | No Meeting |
| Feb 24, 2014 | Ohm's Law |
| Mar 3, 2014 | RC Circuits |
| Mar 10, 2014 | Oscilloscopes & RC Circuits |
| Mar 17, 2014 | Measuring Magnetic Fields |
| Mar 24, 2014 | Measuring Magnetic Forces |
| Mar 31, 2014 | No Meeting |
| Apr 7, 2012 | Image Formation |
| Apr 14, 2012 | Interference Patterns |
| Apr 21, 2014 | Measuring the Speed of Light in Air |
| Apr 28, 2014 | Atomic Emission Spectra |
| May 5, 2014 | Planck's Constant |
| May 12, 2014 | No Meeting |