

# Physics 275 Syllabus - Spring 2014

## Professors Steven Anlage and Kiyong Kim

### Official Course Description:

**PHYS275** (*Perm Req*) **Experimental Physics I: Mechanics and Heat; (2 credits)** Grade Method: REG/P-F/AUD. *Prerequisite: PHYS161 or PHYS171; and PHYS174. CORE Physical Science Lab (PL) Course only when taken concurrently with PHYS272.* Methods and rationale of experimental physics. Intended for physics majors and science and engineering students who desire a more rigorous approach. Experiments chosen from the areas of mechanics (from PHYS171), gas laws, and heats. Theory and applications of error analysis.

### What the course is about:

Physics 275 is the second course in the introductory Physics lab sequence PHYS 174-275-276. The course is intended for physics majors and also for science and engineering students who desire a more rigorous introduction to experimental science. Experiments are mainly chosen in the general area of mechanics. A major component of the course is to understand the theory and applications of error analysis. The Lab meets for four hours each week in **Room 3104** of the Physics Building. Roughly three hours of this time will be spent working on the lab and one hour in discussion during the lab.

**Prerequisites:** The prerequisites for the course are Physics 174 and Physics 171 (or Physics161).

**Co-requisite:** You must be simultaneously enrolled in Physics 272 in order to receive credit for a CORE physical sciences laboratory.

### Lab sections:

Lab section	Day	Time	Instructors	Teaching Assistant	Lab Room
0201	Monday	1-4:50 PM	S. Anlage	Swarnav Banik	PHY 3104
0301	Tuesday	2-5:50 PM	K. Kim	Swarnav Banik	PHY 3104
0101	Wednesday	2-5:50 PM	S. Anlage	Mikheil Azatov	PHY 3104
0401	Thursday	2-5:50 PM	K. Kim	Swarnav Banik	PHY 3104

### Instructors:

#### Prof. Steven Anlage

e-mail: [anlage@physics.umd.edu](mailto:anlage@physics.umd.edu)

Office: Room 1363 Physics Building

Phone: 301-405-7321

#### Prof. Kiyong Kim

e-mail: [kykim@umd.edu](mailto:kykim@umd.edu)

Office: Room 1202J ERF (Bldg.223)

Phone: 301-405-4993

### Teaching Assistants

Mikheil Azatov

Swarnav Banik

### e-mail:

[mazatov@umd.edu](mailto:mazatov@umd.edu)

[swarnavbanik90@gmail.com](mailto:swarnavbanik90@gmail.com)

### office:

PHYS 3103B

PHYS 0104

**Office Hours:** You can try stopping by our offices at any time, but if you can't find us, make an appointment by e-mail.

### Required Texts:

(1) "*Physics 275 Lab Manual*" – Fourth Edition (June 2010)

(2) "*A Practical Guide to Data Analysis for Physical Science Students*" by Louis Lyons.

### Recommended Texts:

- (1) "Introduction to Error Analysis" by John R. Taylor.
- (2) "Data Reduction and Error Analysis for the Physical Sciences", by P. R. Bevington and D. K. Robinson.

**Arriving late to class:** Classes at Maryland begin right on the hour. It is important that you arrive on time so that you can get instructions for the lab and have time to finish. If you arrive more than 10 minutes late, you may not be allowed into the lab and will have to make it up during another section.

**Making Up Missed Labs:** You should make every effort not to miss your regularly scheduled lab. If you miss your regular lab section, you should make that lab up by going to another section that week or by scheduling a makeup lab with the TA before your next lab.

**Grading:**

40%	Spreadsheet Lab Reports
10%	Homework
25%	First Practical Exam
25%	Second Practical Exam

*Missing one Lab (and not making it up) will cost one letter grade in your final grade. Missing one homework set will cost one-half of a letter grade in your final grade. Final grades will be computed based upon the above weightings.*

**Lab Reports:** Each week, before you leave the lab, you must submit to ELMS an Excel spreadsheet lab report of all the work you completed up to that point. It is recommended that you also email a copy of the report to yourself or save it on a memory stick. If you need to make revisions to this report, or finish some parts, you will have **until 1 PM on the following Monday** after you had the lab to submit a revised version along with any assigned homework.

**Homework:** Homework will be a combination of problems appearing in the Lab Manual and problems passed out in class. You will turn your homework along with any revisions to your lab report by submitting an Excel spreadsheet to ELMS **no later than 1 PM on the following Monday** after you had the lab. In some of the homework assignments, you will see that there are problems labeled with an H. These are optional problems which are intended "for Hotshots only" and do not count towards your grade. If you like thinking about physics problems, and are looking for something a bit more challenging, please try them. We made these problems just for you.

**\* No credit will be given for late homework unless you have been seriously ill.**

### General Comments:

- You are expected to arrive in class having thoroughly read the write-up in the lab manual for the week's experiment. This is absolutely necessary for a fruitful lab experience.
- Finishing all the lab reports and homework sets is very important. If you can't completely finish a lab and homework set, it is still important to turn in what you do have.
- When you are working on your report or homework, feel free to discuss with other students to try to figure out what is going on. However, do not use these discussions as an excuse to copy someone else's report or solution, or let someone else copy yours. That is cheating and is strictly forbidden. It is also self-defeating since a large part of your grade (50%) will come from tests. The right way to proceed is to first work through the report and problems yourself and to arrive at a definite answer. With this preparation, you can then discuss intelligently with your

colleagues and see if you have missed something essential. Of course, you can always ask one of your instructors.

**In case of Bad weather:** If the University is closed during a scheduled lab, class will be cancelled, and we will most likely reschedule the lab for the following week. Closing is announced over local radio and TV as well as on the [University's homepage](#).

**Academic Integrity:** The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity or the Student Honor Council, please visit <http://www.studenthonorcouncil.umd.edu/whatis.html>.

## Schedule for Phys275, Spring 2014

<u>Week of</u>	<u>Experiment</u>
Jan 27 – 30	Experiment 1 - <i>Diagnostic</i>
Feb 3 – 6	Experiment 2 - <i>Dice and Distributions</i>
Feb 10 – 13	Experiment 3 - <i>Statistics of Random Decay</i>
Feb 17 – 20	Experiment 4 - <i>Position, Velocity, and Acceleration</i>
Feb 24 – 27	Experiment 5 - <i>Free Fall of a Mass</i>
Mar 3 – 6	Experiment 6 - <i>First Review (Experiments 1-5)</i>
Mar 10 – 13	<b>First Practical Exam</b>
Mar 17 – 20	<b>Spring Break</b>
Mar 24 – 27	Experiment 7 - <i>Standing Waves on a String</i>
Mar 31 – Apr 3	Experiment 8 - <i>Mass and Spring Oscillator</i>
Apr 7 – 10	Experiment 9 - <i>Anharmonic Motion</i>
Apr 14 – 17	Experiment 10 - <i>Measuring g with a Pendulum</i>
Apr 21 – 24	Make-up Lab
Apr 28 – May 1	Experiment 11 - <i>Second Review (Experiments 7-10)</i>
May 5 – 8	<b>Second Practical Exam (Last Lab; No Final Exam)</b>