Physics 275 Syllabus - Fall 2019
Professor Alberto Belloni

Official Course Description: PHYS275 - Experimental Physics I: Mechanics and Heat (2 credits) *(PermReq)* Grade Method: REG/P-F/AUD. *Prerequisite: PHYS161 or PHYS171. Additional information: 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 first course in the new lab sequence PHYS 275-276-375-405. 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 concerns understanding error analysis, both learning how to do it and appreciating what a useful tool it is. The Lab meets for four hours each week in **Room 3104** of the John Toll Physics Building. You should expect that roughly three hours of this time will be spent working on the lab and one hour in discussion with your instructors and other students during the lab. To get the latest information on Physics 275, check ELMS Canvas or:
> https://umdphysics.umd.edu/academics/courses/962-physics-275-experimental-physics-i.html

* Prerequisites: The prerequisite for the course is Physics 171 (or Physics161).
* Co-requisites: The co-requisite is Physics 272.

Lab sections: All sections meet in Room 3104 in the John Toll Physics Building

section	Day	Time	Instructor	Teaching Assistant
0101	Monday	2-5:50 PM	Fred Wellstood	TBA
0301	**Tuesday**	**2-5:50 PM**	**Alberto Belloni**	TBA
0201	Wednesday	2-5:50 PM	Fred Wellstood	TBA
0401	**Thursday**	**2-5:50 PM**	**Alberto Belloni**	TBA

*Contact Information for Course Instructors:

Prof. Fred Wellstood	**Prof. Alberto Belloni**
e-mail: well@squid.umd.edu	abelloni@umd.edu
Office: 0367 Physics Building	3208F Physical Sciences Complex
Phone: 301-405-7649	301-405-6058

* Teaching Assistants   e-mail   office   phone

* Office Hours: You can try stopping by our offices at any time or make an appointment by e-mail.

* Required Texts:
(1) "*Laboratory Manual for Experimental Physics I: Mechanics*" – 8th Edition - June 2019. This Lab Manual and access to the Homework Questions for PHYS275 are only available electronically from the online service Expert TA. In order to purchase the lab manual from Expert TA, follow the steps listed below in the section on Expert TA. If the University bookstore incorrectly lists "*no textbook required*" for the course, don't be fooled - you need to purchase electronic access to the lab manual and homework questions by going to Expert TA. In order to buy the manual online you will need the "class code" listed below corresponding to your particular section of Phys 275.
(2) "*A Practical Guide to Data Analysis for Physical Science Students*" by Louis Lyons, Cambridge University Press (1991).
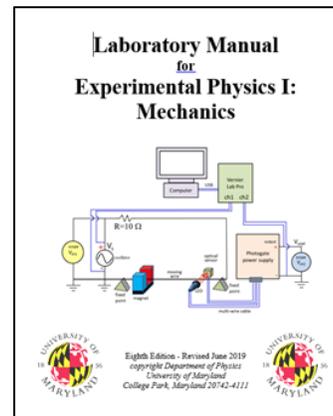
Purchasing the Lab Manual from Expert TA and access to Homework:
1. Locate your section number in the table below and find the corresponding **Expert TA link for the class code** for your specific section.
2. Double-check that the section you are enrolled in on Testudo or ELMS has the same section number, and meets on the same day, as listed in the table below.
3. Copy the correct link to your section's class code, paste it into your browser, open the link and follow the instructions.

Lab sections:

section	Day	Time	Instructor	Expert TA link for class code
0101	Monday	2-5:50 PM	Fred Wellstood	-
0301	**Tuesday**	**2-5:50 PM**	**Alberto Belloni**	http://goeta.link/USH22MD-A2BF10-1UP
0201	Wednesday	2-5:50 PM	Fred Wellstood	-
0401	**Thursday**	**2-5:50 PM**	**Alberto Belloni**	http://goeta.link/USH22MD-A997D6-1UO

* Recommended Texts: The standard introductory texts to data analysis in physics are:
(1) "*An Introduction to Error Analysis*", 2nd Edition, J. R. Taylor, University Science Books (1997).
(2) "*Data Reduction and Error Analysis for the Physical Sciences*" by P. R. Bevington, McGraw Hill (1969).

* 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: 35% Spreadsheet Lab Reports
                  10% Pre-Lab Assignments   20% First Practical Exam
                  10% Homework Assignments   25% Second Practical Exam

You must complete all experiments to pass the course. *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. Standard grading will be followed (A is 90-100, B is 80-90, *etc.*) unless the class's distribution of scores is unusual, in which case a standard curve will be used. **NOTE: Don't be fooled by the "Total Score" column listed in ELMS Canvas. It is incorrect because it does not have your Expert TA Homework scores and does not use the required weights listed above**.

* Pre-Lab Assignments - In addition to Homework Assignments, each lab typically also has a Pre-Lab Assignment. The crucial distinction is that Pre-Lab Assignment for each experiment is due before your lab section meets to do the lab, while the Homework Assignment for each experiment are typically due the week after your section does the experiment. Pre-lab assignments must be completed on Expert TA and typically require you to answer a few questions about the lab. The purpose of the Pre-Lab Assignments is to make sure that you have looked through the Lab Manual and understand the key concepts before you try to do an experiment.

* Your Lab Report - Each week, before you leave the lab, you must submit to ELMS Canvas an Excel spreadsheet lab report of all the work you completed so far. If you need to make revisions to this report, or finish some parts, you must submit a revised report before the start of your next lab session.

* Homework is assigned on **Expert TA**. Typically there is a homework assignment at the end of each Lab and it is due before the start of your next lab session. To get credit for completing the homework, you must log into your own area in Expert TA and submit your answers via **Expert TA** before the deadline.

* No credit will be given for late homework unless you are seriously ill and provide a written note from your physician.

* 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.

* General Comments on the Lab report and Homework:
        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 very self-defeating since a large part of your grade (50%) will come from tests. The right way to proceed is first to work through the report and arrive at a definite answer on your own. 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 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, then go ahead and try them - we made these problems just for you.

* In case of bad weather: If the University is open and you have a schedule lab, then the lab will be open and you need to attend. On the other hand, winter in the Washington metro area often brings large snowstorms that make travel difficult and dangerous. The University is usually quite proactive in closing when road conditions are likely to be dangerous or in emergency situations. Closures are announced on the [University's homepage](#) and over local radio and TV. If your lab section is scheduled to meet during a time when the University is closed due to bad weather, that section of the lab will be cancelled. Check with your instructor on when the experiment will be rescheduled - typically this will be the following

week or during the week set aside for Lab Make-ups, depending on how many days the University was closed.

* One final thing, if you miss something fundamental in a lab or test, you may be assigned extra problems to solve until you master the concept.

Physics 275 - Fall 2019

(Preliminary Schedule - last updated August 20, 2019)

Monday Aug 26	First day of fall Semester - Labs start meeting!
Aug 26 – Aug 29	Experiment 1 - *Excel and Uncertainties*
Monday Sept 2	**Labor Day** - no classes
Sept 3 – 5	Make-up Labs (Tuesday, Wednesday & Thursday of Labor Day week)
Sept 9 – 12	Experiment 2 - *Propagation of Errors and* χ^2
Sept 16 – 19	Experiment 3 – *Dice and Distributions*
Sept 23 – 26	Experiment 4 - *Random Decay*
Sept 30 - Oct 3	Experiment 5 - *Position, Velocity and Acceleration*
Oct 7 – 10	Experiment 6 - *First Review (Experiments 1-5)*
Oct 14 – 17	Experiment 7 - ***First Practical Exam***
Oct 21 – 24	Experiment 8 - *Free Fall*
Oct 28 – 31	Experiment 10 - *Forced Harmonic Motion*
Nov 4 – 7	Experiment 11 - *Standing Waves*
Nov 11 – 14	Experiment 12 - *Measuring g to 0.1%*
Nov 18 – 21	Experiment 14 - *Second Review (Experiments 8, 10, 11, 12)*
Nov 25 – 26	Make-up Labs (Monday & Tuesday of Thanksgiving week)
Nov 27 – 29	**Thanksgiving break** (Wednesday-Friday)
Dec 2 – 5	Experiment 15 - ***Second Practical Exam***
Dec 9	*Last day of classes* (Monday)
Dec 10	*Reading Day* (Tuesday)
Dec 11 – 17	*Final Exams*
Dec 17 – 18	*Commencement*