

Physics 261 - Fall 2011
General Physics: Vibrations, Waves, Heat, Electricity and Magnetism (Laboratory)
Instructor: Professor Fred Wellstood - Sections 0101 to 0124

Official Course Description: General Physics: Vibrations, Waves, Heat, Electricity and Magnetism (Laboratory); (1 credit) Grade Method: REG/P-F/AUD. *CORE Physical Science Lab (PL) course only when taken concurrently with PHYS 260. Corequisite: PHYS260.* Lab includes experiments on mechanics, vibrations, waves, heat, electricity and magnetism. PHYS260 and PHYS261 (lab) must be taken in the same semester and the grade for the courses will be combined into a single grade for both. To pass, students must complete passing work in both PHYS260 and PHYS261. Students must pay a \$50.00 laboratory materials fee.

Co-requisite: PHYS260

CORE status: This course is designated a CORE Physical Science Lab (PL) Course when taken in conjunction with PHYS260

Instructor: Prof. Fred Wellstood,
 Dept. of Physics, Room 0367 Physics Building,
well@squid.umd.edu (on campus x57649)
 Office Hours Tuesday: 1:30pm to 2:30pm or by e-mail appointment

Laboratory sections: You must attend your assigned section at the scheduled meeting time.

See Schedule: Group A meets on weeks 2, 4, 6, 8, 10, 12

Group B meets on weeks 3, 5, 7, 9, 11, 13

| Section # | Meeting time | Room | Group A or B | Teaching Assistant | e-mail |
|-----------|---------------------|----------|--------------|--------------------|-----------------------------|
| 0101 | M 8:00am -10:50am | PHY 3219 | B | Sungwoo Hong | shong710@umd.edu |
| 0102 | M 12:00pm -2:50pm | PHY 3219 | B | Ryan Maunu | rmaunu@umd.edu |
| 0103 | M 3:00pm - 5:50pm | PHY 3219 | B | Avinash Kumar | akumar15@umd.edu |
| 0104 | Tu 10:00am-12:50pm | PHY 3219 | A | T.B.A. & Min Kim | mseok@umd.edu |
| 0105 | Tu 1:00pm - 3:50pm | PHY 3219 | A | Ryan Maunu | rmaunu@umd.edu |
| 0106 | M 7:00pm - 9:50pm | PHY 3219 | B | Ryan Maunu | rmaunu@umd.edu |
| 0107 | Tu 7:00pm - 9:50pm | PHY 3219 | A | Sungwoo Hong | shong710@umd.edu |
| 0108 | W 7:00pm - 9:50pm | PHY 3219 | A | Avinash Kumar | akumar15@umd.edu |
| 0109 | W 8:00am -10:50am | PHY 3219 | A | Sungwoo Hong | shong710@umd.edu |
| 0110 | Tu 4:00pm - 6:50pm | PHY 3219 | A | Avinash Kumar | akumar15@umd.edu |
| 0111 | W 1:00pm - 3:50pm | PHY 3219 | A | Min Kim | mseok@umd.edu |
| 0112 | W 4:00pm - 6:50pm | PHY 3219 | A | Josue Morales | josuemorales.work@gmail.com |
| 0113 | Th 8:00am - 10:50am | PHY 3219 | A | Josue Morales | josuemorales.work@gmail.com |
| 0114 | Th 11:00am - 1:50pm | PHY 3219 | A | Min Kim | mseok@umd.edu |
| 0115 | Tu 1:00pm - 3:50pm | PHY 3219 | B | Ryan Maunu | rmaunu@umd.edu |
| 0116 | Tu 4:00pm - 6:50pm | PHY 3219 | B | Avinash Kumar | akumar15@umd.edu |
| 0117 | Th 2:00pm - 4:50pm | PHY 3219 | A | Josue Morales | josuemorales.work@gmail.com |
| 0118 | Th 11:00am -1:50pm | PHY 3219 | B | Min Kim | mseok@umd.edu |
| 0119 | Th 2:00pm - 4:50pm | PHY 3219 | B | Josue Morales | josuemorales.work@gmail.com |
| 0120 | W 1:00pm - 3:50pm | PHY 3219 | B | Min Kim | mseok@umd.edu |
| 0121 | Tu 7:00pm - 9:50pm | PHY 3219 | B | Sungwoo Hong | shong710@umd.edu |
| 0122 | W 9:00am - 11:50am | PHY 3219 | B | Sungwoo Hong | shong710@umd.edu |
| 0123 | W 4:00pm - 6:50pm | PHY 3219 | B | Josue Morales | josuemorales.work@gmail.com |
| 0124 | W 7:00pm - 9:50pm | PHY 3219 | B | Avinash Kumar | akumar15@umd.edu |
| 0125 | Th 6:00pm-8:50pm | PHY 3219 | A | Ryan Maunu | rmaunu@umd.edu |

Note: Each Lab section is labeled as group A or group B

Both groups complete Lab 0 during first week (stop by the lab if you need help)

Table of Group-A sections: Group A meets on weeks 2, 4, 6, 8, 10, 12, 14 (see schedule below)

| | Monday | Tuesday | Wednesday | Thursday | Friday |
|----------|--------|---------|-----------|----------|-------------|
| 8:00 AM | | | | | |
| 9:00 AM | | | 109 - A | 113 - A | |
| 10:00 AM | | 104 - A | Hong | Morales | |
| 11:00 AM | | T.B.A. | | | |
| 12:00 PM | | & Kim | | 114 - A | |
| 1:00 PM | | | | Kim | TA Lab |
| 2:00 PM | | 105 - A | 111 - A | | preparation |
| 3:00 PM | | Maunu | Kim | 117-A | |
| 4:00 PM | | | | Morales | |
| 5:00 PM | | 110 - A | 112 - A | | |
| 6:00 PM | | Kumar | Morales | | |
| 7:00 PM | | | | 125 - A | |
| 8:00 PM | | 107 - A | 108 - A | Maunu | |
| 9:00 PM | | Hong | Kumar | | |

Table of Group-B-sections: Group B meets on weeks 3, 5, 7, 9, 11, 13, 15 (see schedule below)

| | Monday | Tuesday | Wednesday | Thursday | Friday |
|----------|---------|---------|-----------|----------|-------------|
| 8:00 AM | | | | | |
| 9:00 AM | 101 - B | | | | |
| 10:00 AM | Hong | | 122 - B | | |
| 11:00 AM | | | Hong | | |
| 12:00 PM | | | | 118 - B | |
| 1:00 PM | 102 - B | | | Kim | TA Lab |
| 2:00 PM | Maunu | 115 - B | 120 - B | | preparation |
| 3:00 PM | | Maunu | Kim | 119 - B | |
| 4:00 PM | 103 - B | | | Morales | |
| 5:00 PM | Kumar | 116 - B | 123 - B | | |
| 6:00 PM | | Kumar | Morales | | |
| 7:00 PM | | | | | |
| 8:00 PM | 106 - B | 121 - B | 124 - B | | |
| 9:00 PM | Maunu | Hong | Kumar | | |

Lecture and Lab: To pass Physics 261, you must complete all the labs in Physics 261 and you must enroll in and pass the lecture part of the course (Physics 260) in the same semester.

Grading Policy:

| | |
|--|-----|
| prelab questions (due before your lab session starts) | 10% |
| data (due at the end of your lab session) | 25% |
| analysis (due at the end of your lab session) | 20% |
| postlab questions (due at the end of your lab session) | 10% |
| Culminating lab | 35% |

Your score from the Physics 261 Lab will be combined with your score from the Physics 260 Lecture part of the course to produce one, overall, common score for both Physics 260 and Physics 261. The

score from Physics 261 will be weighted 25% and the score from Physics 260 will be weighted 75% to produce this final score.

Required Textbook: Physics 261 Lab Manual, Fall 2010 Edition.

Required Software: You will also need a Mastering Physics access code so you can do the pre-lab questions on-line. If you are taking Physics 260, then you should already have had to get a code and do not need to get another one. If you took 161 in the last year then you are all set - your Mastering Physics access code from 161 is good for two years. If you don't already have an access code from when you took Physics 161, then you have two options:

- 1) Purchase a used book, and purchase the Mastering Physics access code at www.masteringphysics.com for \$44.50.
- 2) Buy textbook bundles with Mastering Physics directly from the publisher. Only one volume needs to be bundled with Mastering Physics, the others can be bought unbundled.

The access number is needed to get on-line access to the web-based homework collection system called Mastering Physics. Also, make sure you get the second edition! If you are wondering if you really need to get the book and access number to pass the course, the answer is: Yes, you really need to get the book and access number to pass the course.

Course Outline: You will attend lab once every two weeks. There are no meetings during the first week since it is a short week but you must complete Experiment 0 found in the lab manual. This is an Excel practice lab which you can work through and turn it in to the Physics 261 site on ELMS Blackboard. Group A meets the second week (the week of Labor Day vacation, which is OK since there are no Group A sections on Monday), Group B meets the third week, followed by group A the fourth week, etc. See the Schedule below.

There is one introductory lab (Lab 0), five main experiments (Labs 1, 2, 3, 5, 7), a practice lab for the Culminating lab, the Culminating Lab itself, and one week to make up missed labs.

Each lab session lasts three hours, and will begin with a 10 minute discussion of the lab by the TA. Each week you must turn in answers to the Prelab questions by putting your solutions into Mastering Physics before the start of your lab period. The pre-lab questions are found in the lab manual. At the end of your lab session, you need to turn in a lab report. This report is to be turned in to the Physics 261 area in ELMS Blackboard. The report itself consists of an Excel spreadsheet which will contain all data taken, as well as analysis and discussion. The report is expected to be a succinct summary of data, analysis and conclusions without redundant or superfluous discussion. **The spreadsheet itself must be turned in at the end of the lab session (upload it to the Physics 261 site on ELMS Blackboard).** Lab reports turned in after the end of a lab but less than an hour late will have 10% of the total possible score deducted. Lab reports turned in more than one hour late will lose all credit for the lab. The key point is to turn in a copy of your report before you leave. In fact, it is best if you upload copies regularly to Blackboard as you are working on the experiment so that there is no chance of getting a zero for a lab you completed.

The Prelab Questions: Prelab Questions are due before the start of your lab section. You must log into the Physics 261 area in Mastering Physics and turn in the answers to your questions no later than the start of your regular lab session. The labs generally require less than two hours to perform, leaving ample time for analysis and interpretation. However, to perform the experiment in this limited time you will have to be prepared. It is therefore essential that you come to lab having completed the pre-lab questions and having read and understood the lab write-up. It should not surprise you to learn that the answers to all the Prelab Questions can be found by reading the lab.

The Lab Report: At the end of your lab session, you will need to turn in a lab report. Lab reports are not meant to be long or extremely time consuming. In fact, in this class all we require you to turn in is

the Excel file in which you recorded all your data, made plots, did analysis and wrote out the answers to the questions.

The Final Questions in Each Lab: At the end of each lab there is typically a set of “Final Questions”. These are to be completed and turned in with your lab report spreadsheet at the end of each lab session.

The Culminating Lab: is a closed book practical exam, in which you answer questions about the labs, which may require you to take data using the equipment from the prior lab sessions. To give you a better idea of what is involved, there is a practice lab for the Culminating Lab. You are not required to attend this practice, but failure to prepare for the Culminating Lab will likely be detrimental to your performance on the real exam.

Missing a Lab: In order to pass the class all labs and culminating lab must be completed, without exception. Students are permitted to perform labs in make-up sessions only if they have a legitimate reason for failing to attend a lab session. In the event that you miss a lab session, e-mail the instructor, who may be able to make arrangements for you to attend another section during the same week. If you do not hear from your instructor right away, then by all means try stopping by the Lab to see if there is an open spot. The labs are full and in general there are not going to be any open seats available. However, experiments run for two weeks and if you can take care of a missed lab in the week it is still set up, by all means do so. However, you will need to make sure that the TA who you are sitting in with, your regular TA, and your instructor, all are aware of your situation. It is not OK to just go to a section because it is more convenient than your assigned section.

***Important Notes:**

(1) YOU MUST COMPLETE ALL THE LABS IN PHYSICS 261 IN ORDER TO PASS PHYSICS 260. There are no exceptions. Students who do not complete all of the experiments in physics 261 will automatically get an F in both Physics 260 and Physics 261. Don't believe anyone who tells you differently.

(2) Phys 261 sections will start meeting the **second** week of class. You must do Experiment 0 to be eligible to do the rest of the course.

(3) You must take the Culminating Lab, which is a practical exam, in order to pass the course.

(4) No lab, prelab, or exam scores will be dropped. Missing a lab will require that you make it up as soon as possible, and preferably in the same week that it is missed. The new due date must be arranged by consulting with Dr. Wellstood (well@squid.umd.edu) as soon as possible after it becomes apparent that there will be a problem. If you are going to miss a lab because of a religious holiday, it is your responsibility to inform the instructor of any intended absences for religious observances in advance, so that suitable arrangements can be made.

About the course: Physics 261 is the lab for the second semester of the three-semester 161/260/270 sequence in introductory physics intended for engineering students. You must also be enrolled in the Physics 260 in order to pass Physics 261. Physics 260/261 is a CORE physical science course with a lab. The lecture part of the course covers material in three main areas: Oscillations and Waves; Fluids and Heat; and Electricity through dc circuits. The laboratory part of the course has experiments in mechanics and thermodynamics. This is a calculus-based sequence and makes extensive use of material in Math 140 and 141. Students are responsible for all assigned material, including reading, prelab questions, final questions, the operation of equipment used in the labs.

Exams: There is one exam in the class. It is called the Culminating Lab and is a practical test of what you have learned in the lab. If you cannot attend the exam at the scheduled time, see Professor Wellstood before the exam! If you miss the exam with a valid excuse, a makeup exam will be given

and it is your responsibility to arrange this in a timely fashion with the instructor. Students are responsible for all material in the lab and homework.

Excuses: Missing a lab or an exam is not allowed without a valid documented excuse as defined by the University (medical problem, religious holiday, or serious family crisis). In all cases, a makeup lab or makeup exam must be completed in a reasonable amount of time or you will receive a score of zero for the assignment or exam. The makeup test or lab, and the due date, must be arranged by consulting with Dr. Wellstood as soon as possible after it becomes apparent that an exam or lab will be missed. If you are going to miss a lab or exam because of a religious holiday, it is your responsibility to inform the instructor in advance so that suitable arrangements can be made.

Submitting your Prelab questions: To turn in your Prelab Questions, you need to go to:

<http://www.masteringphysics.com/>

The site is best accessed with a current version of Windows Explorer. If you run into problems check the system requirements. If you have not used Mastering Physics before then you should log on to the site and try the practice set before attempting any of the real prelab sets. Most of you will already be familiar with Mastering Physics from using it in Physics 161 or Physics 260. If you give a wrong answer, you can go back and try again to see if you can get the correct solution. You will be allowed 5 attempts for each question, so don't waste them. You are graded only on your final answers and you will know your score when you are done. Note that the software may randomize the numbers on a problem, so be careful and remember that the lab manual or other students working on exactly the same problem may not have the same numbers as you do! The best way to do the problems is first to work out carefully a general solution and then plug in the numbers at the end. For calculating complicated expressions, I strongly recommend using an electronic spreadsheet, such as Excel, rather than a calculator.

Registering and Gaining Access to Mastering Physics: In order to turn in your PreLab Questions, you will need to register at the Mastering Physics website <http://www.masteringphysics.com/>. To register, you need two things - an access number and the class ID. The access number will be packaged with new copies of the Knight text book. In other words, when you buy your textbook you need to get a new copy that comes packaged with an access number. The class ID for the Physics 261 Lab is MPWELLSTOOD56099.

Academic honesty: I expect you to get together in small groups and discuss the labs. However, do not use these discussions as an excuse to copy someone else's data, prelab answers or solutions to the homework or let someone else copy your solution. That is cheating. The right way to proceed is first to read through the lab, then do the prelab, and then take a look at the final questions. With this preparation you can then discuss with others and see if you have missed something. All work you submit must be your own and should reflect your own understanding. Academic dishonesty, including copying homework, Googling for solutions on the web, or cheating on an exam, is a very serious offense which may result in suspension or expulsion from the University. Don't do it. Details on the policy can be found at

www.testudo.umd.edu/soc/dishonesty.html.

Help with understanding the material: Learning physics and engineering is a cumulative process: the knowledge learned at each stage builds upon previous knowledge and skills. If you find that you are falling behind, seek help early on, rather than waiting until just before an exam. Help can be obtained by:

- Regularly attending lecture and discussion sections.
- Visiting the Slawsky Clinic, Mon. – Fri., 10-11 and 12-1, in room 1140 Physics Building.
- Going to the office hours of Professor Wellstood or your TA.

- The Learning Assistance Service (2201 Schoemaker Bldg., 301-314-7693) helps students with time management, reading, note taking, and exam preparation skills.

If you find that you are having more general academic problems, or are having trouble figuring out what you want to do, I recommend that you stop by Room 1120 Physics and talk to Tom Gleason, the Physics Coordinator of Student Services. Tom graduated from Maryland and also used to be an advisor in Letters and Science (undeclared majors). He is now the advisor for physics majors, but he knows all the University rules and is a great person to talk to because of his perspective on Physics and other programs at the University.

PRELIMINARY SCHEDULE
for
Physics 261- Fall 2011

| week # | Dates | Group | Main Topics |
|---------------|------------------|------------------|---|
| - | August 31 | | Start of Fall semester - First Day of classes |
| 1 | Aug. 31- Sept. 2 | A & B | Do "Lab 0: Excel Spreadsheet Lab" by yourself and turn it in to ELMS Blackboard. No meetings this week, but stop by the lab if you need help. |
| | Monday, Sept. 5 | | Labor Day |
| 2 | Sept 6 - 8 | A | Group A Lab 1: Intro to Data and Error Analysis |
| 3 | September 12-15 | B | Group B does Lab 1: Intro to Data and Error Analysis |
| 4 | September 19-22 | A | Group A Lab 2: The Pendulum |
| 5 | September 26-29 | B | Group B Lab 2: The Pendulum |
| 6 | October 3-6 | A | Group A Lab 3: Forced Harmonic Motion |
| 7 | October 10-13 | B | Group B Lab 3: Forced Harmonic Motion |
| 8 | October 17-20 | A | Group A Lab 5: Position, Velocity and Acceleration |
| 9 | October 24-27 | B | Group B Lab 5: Position, Velocity and Acceleration |
| 10 | Oct. 31 - Nov. 3 | A | Group A Lab 7: Ideal Gas Law and Absolute Zero |
| 11 | November 7-10 | B | Group B Lab 7: Ideal Gas Law and Absolute Zero |
| 12 | November 14-17 | A | Group A Makeup and Practice for Culminating Lab |
| | *Friday, Nov 18 | B | *The lab will be open Friday Nov 18 to allow Thursday group B sections 118 and 119 to do the makeup and practice for the Culminating Lab before Thanksgiving week |
| 13 | November 21-23 | B | Group B Makeup and Practice for Culminating Lab |
| 14 | Nov. 28 - Dec 2 | A | Group A Culminating Lab |
| 15 | Dec 5 - 9 | B | Group B Culminating Lab |
| 16 | Dec 12-16 | A&B | Group A and B Makeup Labs |