

Physics 2306
FOUNDATIONS OF PHYSICS
Fall 2010

Instructor

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Office Hours

Mondays 9am – 10am Wednesdays 9:30am – 10:30am Fridays 1:30pm – 2:30pm, exceptions announced, and by appointment. Anytime I am in my office and I have time, you are more than welcome to talk to me. I strongly believe in one on one discussions and help. If you need to meet with me outside the office hours, you can also talk to me after class or email me for an appointment. E-mail is generally NOT the best way to contact me. Homework questions are especially difficult to deal with over e-mail. In person contact is always preferred.

Textbook

University Physics, 11th or 12th Edition, by Young and Freedman together with Mastering Physics. A new book comes with a *Mastering Physics* Students Access Code. If you purchased a used book, you should get a Student Access Code from www.masteringphysics.com.

Lecture notes

The lecture periods will cover conceptual discussions, sample problems, lecture and demonstrations. Dialogue is encouraged and questions in class are very welcome! The class period is meant to *supplement* your study of the textbook, so you are strongly advised to read the textbook material prior to coming to class.

While strongly encouraged, attendance is optional. *However*, you are responsible for being aware of any announcements made in class (such as changes to the schedule and/or syllabus) even if you did not attend.

Recitations

In addition to the lectures, it is mandatory to attend your recitation section. These are mostly problem solving sessions where questions about homework and additional examples and problems will be discussed. Occasionally, class material will be also discussed.

Homework

Will be assigned through **MasteringPhysics (Course ID: MPKHAN13460)**. You will be asked for your VT student ID number. Enter this number without a space or hyphen between the first four and last five digits! The importance of your doing homework can hardly be overstated. Students are strongly encouraged to discuss problems and questions among themselves, but they are not to share solutions. What you submit must be your own work. You may use an idea gained from a discussion, but may not copy the written details. Evidence of copying could result in your appearance before the honor court!

Tests

There will be three tests administered on scheduled days and a course final. The final exam will NOT be cumulative. You will be permitted to bring one 8x11 *double-sided* “cheat sheet” and a calculator to each test. If you have to miss a test and wish not to get a zero from the test, you must submit a written explanation about the reason why you have to miss the test. Your written statement should be submitted prior to the test, unless there is a documented medical reason for missing the test

Grading

The following grading schemes will be used: homework will contribute **25%** of the course score, Labs **15%**; three tests and Final **60%**.

Final Grades:

Final letter grades will be assigned according to the following:

- **A** **93% and above**
- **A-** **90% - 92%**
- **B+** **87% - 89%**
- **B** **83% - 86%**
- **B-** **80% - 82%**
- **C+** **77% - 79%**
- **C** **73% - 76%**
- **C-** **70% - 72%**
- **D+** **67% - 69%**
- **D** **63% - 66%**
- **D-** **60% - 62%**
- **F** **below 60%**

Prerequisite: Passing Grade in MATH 1205, PHYS 2305, Corequisite: MATH 1206

Honor System

The Virginia Tech Honor code applies to all graded work in this course. Students are responsible for understanding and adhering to the Honor Code. Among other things, the Honor Code prohibits giving or receiving unauthorized aid, assistance, or unfair advantage on academic work, including plagiarism. Prior to each test or quiz and the final examination, the instructor will identify what aids and sources of information may be used. Copying a solution from any source is prohibited. The assignment that a student hands in must be the product of student's own understanding of the material.

Students with special needs

Any student who feels a need for an accommodation because of a disability (learning disability, attention deficit disorder, psychological, physical, etc.) please make an appointment to see me during office hours.

Laboratory

The laboratory periods are designed to apply the theoretical concepts presented in the lectures to actual situations. This time allows you to develop good observation, data-taking, and data-interpretation skills. This component of the course is very important, and the consequences of not completing all of the experiments are severe. **YOUR FINAL COURSE GRADE WILL BE DROPPED BY ONE-THIRD OF A LETTER GRADE FOR EVERY 2 LABS NOT SATISFACTORILY COMPLETED.** For example: if two labs are missing a B+ would become a B; if four labs are missing a B+ would become a B-. Complete information about the laboratory procedures and policies, laboratory schedules, and TA office hours and contact information can be found at the laboratory website (<http://www.phys.vt.edu/~labs/>).

Ph2306 Lab Information:

Questions regarding the Lab should be directed to Mark Pitt, not to me.

This is his e-mail Mark Pitt, Laboratory Coordinator

309 Robeson, 231-3015, pitt@vt.edu

PHYSICS 2306: FOUNDATIONS OF PHYSICS I

Fall 2010

Text: *University Physics* by Young & Freedman

<u>Week</u>	<u>Start Date</u>	<u>Topics</u>	<u>Laboratory Exercise</u>
1	8/24	Introduction, Properties of Mechanical Waves, Energy in Waves, Wave Interference, Standing Transverse Waves and Normal Modes	
2	8/31	Properties of Sound Waves, Standing Sound Waves and Normal Modes, Interference, Beats, Doppler Effect	
3	9/7	Electric Charge, Coulomb's Law, Electric Fields (E), Fields Due to Charges	Lab 1: Vibrating String
4	9/14	Gauss' Law and Applications, Review for Test 1 at 5:30 PM on 9/17,	Lab 2: A Look at Sound
5	9/21	Charges on Conductors, Potential Energy, Electric Potential, Calculating Potential, Equipotentials, Capacitance, Capacitors in Series & Parallel	Lab 3: Electrostatics
6	9/28	Electric Field Energy; Dielectrics, Electric Current, Resistance, Electromotive Force, Circuits	Lab 4: Mapping Electric Equipotentials
7	10/5	Resistors-Series & Parallel, Kirchhoff's Rules, Instruments, RC Circuits, Power Dist. Systems	Lab 5: DC Circuits 1
8	10/12	Review for Test 2 at 5:30 PM on 10/15,	Lab 6: DC Circuits 2
		Fall Break Oct 8th	
9	10/19	Magnetic Fields (B), Moving Charges in B , Force & Torque on Current-Carrying Wires, Magnetic Fields Due to Charges & Currents	Lab 7: Time Dependent Circuits 1
10	10/26	Force Between Currents, Ampere's Law, Solenoids & Toroids, Magnetic Materials, Faraday's & Lenz's Law, Induced E	Lab 8: Magnetism 1
11	11/2	Eddy Currents, Displacement, Maxwell's Equations, Mutual & Self Inductance, Field Energy, R-L, L-C and L-R-C Circuits, Phasors, AC Circuits, Reactance	Lab 9: Magnetism 2
12	11/9	Impedance, L-R-C Power & Resonance, Electromagnetic Waves, Energy and Momentum in EM Waves, Electromagnetic Spectrum, Reflection, Refraction Test 3 at 5:30 PM on 11/12,	Lab 10: Time Dependent Circuits 2
13	11/16	Energy and Momentum in EM Waves, Electromagnetic Spectrum, Reflection, Refraction, Dispersion, Polarization, Huygens' Wavelets, Images Formed by Reflecting Surfaces	Lab 11: Time Dependent Circuits 3
		Thanksgiving Break	
14	11/30	Lenses, Optical Instruments, Interference, Two-Slit Interference, Thin-Film Interference, Single-Slit Diffraction, Gratings, Resolution Limits	Lab makeup week
15	12/7	Review for the Final Exam Final : Dec. 16th, 7:45-9:45 AM,	