

Physics 232
Spring 2009 Semester (sections 232005, 232006, 232007)
Fundamentals of Physics: Waves, Optics and Modern Physics

Logistics

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| Instructor | Dr. Norman Mannella |
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| Email | nmannell@utk.edu |
| Lecture Time and Location | M W F, 8:00 - 8:50, Room 415 - Nielsen |
| Office Hours | By appointment, in my office (Nielsen 407 B) |
| Laboratory Time, Location and Instructors | Sec. 232005: M 16:40 - 18:35 in Phy508 (Reagan) Sec. 232006: T 12:20 - 14:15 in Phy508 (TBA) Sec. 232007: T 16:40 - 18:35 in Phy508 (Ganguli) |
| Textbook | University Physics with Modern Physics, 12 th edition, by H. D. Young, R. A. Freedman. Addison-Wesley |

General Course Description

This class is a continuation of Physics 231. This course covers material concerning oscillations, waves, sound, light, optics, special relativity, quantum mechanics and basic aspects of modern physics (atomic, molecular, solid state, nuclear and particle physics).

Prerequisites

Physics 231 is a prerequisite. The course and text presume a familiarity with calculus and calculus concepts. A background in mathematics up to the level of Math 141-142, or equivalent, is highly recommended and is probably necessary for success in the course.

Course Repetition Policy

If you are repeating the course, please refer to the [Laboratory Policy Regarding Repeating a Course](http://www.phys.utk.edu/labs/Lab%20Repeat.pdf) (<http://www.phys.utk.edu/labs/Lab%20Repeat.pdf>)

Attendance Policy

Laboratory attendance is strictly mandatory. Although Labs. attendance is required, you will not be required to attend class. However, **class attendance is highly suggested.** Furthermore, if you are not present in class, it will be your responsibility to be aware of the content of any communication taking place in class, be it an announcement or anything related to the course material.

For students with disabilities

Any student who feels s/he may need an accommodation based on the impact of a disability should contact me privately to discuss specific needs. I will then contact the Office of Disability Services at 865-974-6087 in Hoskins Library to coordinate reasonable accommodations for students with documented disabilities.

Textbook

We will use "University Physics with Modern Physics", by H. D. Young, R. A. Freedman. 12th edition, Addison-Wesley, March 2007, ISBN-10: 080532187X, ISBN-13: 9780805321876. Important: this is the new 12th edition. If you already have the previous edition (11th), you do NOT need to purchase the new edition. Nonetheless, please be aware that when referring to the text, I will implicitly refer to the content of the 12th edition. It will be your responsibility to keep track of possible changes with respect to previous editions. Also recommended: A. Halpern and E. Erlbach, Beginning Physics 2: Waves, Electromagnetism, Optics and Modern Physics, Schaum's Outline Series in Engineering, ISBN: 0-07-025707-8, or any other similar physics problem solving book.

Course Material

The class covers most of the materials described in chapters 13,15,16,32-44 of the textbook. Anyhow, this course consists of several components: lectures, laboratories, homework problems, and reading assignments in the textbook. The material you will be expected to learn and will be tested on during the exams will be taught to you as part of all of these course components. In particular, I stress the importance of problem solving and carefully working (not just reading) your way through all the parts of the textbook in chapters 21 - 31. Reading the relevant chapter or sections for each week's lectures (i.e. Reading assignments) is a compulsory and vital part of the course. **The lectures will NOT repeat the material in the textbook**, but will be used to discuss the course material in a variety of ways. Some lectures will follow the textbook, some other will discuss topics not covered in the textbook, and/or discuss them in a different manner.

Reading Assignments

Chapter 13 Oscillations, Simple Harmonic Motion

Chapter 15 Mechanical waves

Chapter 16 Sound

Chapter 32 Electromagnetic Waves

Chapter 33 Light

Chapter 34 Geometric optics

Chapter 35 Interference

Chapter 36 Diffraction

Chapter 37 Relativity

Chapter 38 Photons, electrons and atoms

Chapter 39 Wave nature of particles

Chapter 40 Quantum mechanics

Chapter 41 Atomic structure

Chapter 42 Condensed matter

Chapter 43 Nuclear physics
Chapter 44 Particle physics

Announcements, Lecture Notes and Course Updates

Lecture notes and updates including definite dates for exams will be posted on Online@UT (Blackboard). Please note that lectures and Blackboard are my primary modes of communication with the class. Although class attendance is not required, it will be your responsibility to be aware of the content of any communication taking place in class, be it an announcement or anything related to the course material, in case you are not present. You are required to have an official UT email address (name@utk.edu or name@tennessee.edu) and read your email on a daily basis, since some of the needed information for this class that can not be transmitted to you during the lectures or on Blackboard will be given to you via email.

Laboratory

Labs are obligatory! The laboratory exercises are an important and integral part of this course and have to be completed before a final grade will be assigned. The score assigned by the Lab instructor will count 25% of the final Semester Grade. You must complete all of the Laboratory assignments. Laboratory make-ups are entirely at the Lab. instructor's discretion and arrangements for such must be made with the Lab instructor. Please note: If you fail the Laboratory part of the course, you automatically fail the entire course.

Homework

Homework sets will be assigned On-Line using WebAssign. Please refer to the WebAssign website (<http://webassign.net/>) for log-in and instructions. There will be approximately 12 problem sets. Each problem sets will *generally* be available on-line at 12:00 (noon) each Monday and will be due at 8:00 am on the following Monday. Exceptions (for example at Spring Break) will be noted in class. **Due dates for problem sets are firm. Please note: No extensions or make-up problem sets will be given. In lieu of extensions, the two lowest scores on homework sets will be dropped from the average.** I generally encourage students to work together as far as homework is concerned. The goal is to use homework as one of the most effective ways of assimilating the material. Do not take advantage of the work of other people, and do not let anybody take advantage of your own work: efforts should be shared.

Tests and Final Exam

There will be two Short Tests (1 hour-long) and one comprehensive, Final Exam (2 hours-long). The Tests and the Final Exam are closed book. Questions and Problems on the Short Tests and Final Exam will generally NOT require only a purely numerical answer (like the homework). Short Test and Final questions will generally be similar in character to example problems in the book and example problems given in lectures. For the Short Tests and Final Exam you are required to bring a pencil and a non-programmable pocket calculator. In particular, no laptops, cell phones, or other means of communication are allowed. You will

receive a handout containing information on Physical Constants, Units, selected tables of physical properties, and selected mathematical and physics formulas. The handouts will be posted on Blackboard before Tests and Final Exam. Students are expected to perform all work in conformance with the University policies regarding Academic Honesty. In particular, all work submitted by a student during Tests and Final Exam is expected to represent his/her own work. Violation of the Academic Honesty policies will result in disciplinary actions according to the University rules.

Grading Policy

The semester Grade will be based on a Weighted Averages of the Final Exam grade, Short Tests grades, Laboratory grades, and homework scores. The Homework score will comprise 15% of the final semester Grade. The Laboratory Grade will comprise 25% of the final semester Grade (you must pass the Lab to pass the course). While laboratory work will be graded by each Lab Instructor independently, an effort will be made to insure a uniform grading policy between different laboratory sections. Laboratory make-ups are entirely at the Lab instructor's discretion and arrangements for such must be made with the Lab instructor directly. Short Tests and Final Exam will comprise 60% of the final semester Grade. The Final Exam is mandatory and it will count 30% of the final Grade. The Final Exam is comprehensive, i.e. you will be tested on the whole material covered in class, homework, labs and previous tests. The two Short Tests will together count 30% of the final grade (the two Short Tests count 15% each). Please note: No Short Tests score will be dropped and ordinarily make-up Short Texts will NOT be given. Missing the final exam is very serious and may well result in failure of the course. However, if there are extremely serious circumstances supported by proper documentation, a make-up for Short Tests and/or Final may be considered at my discretion.

Appeals

You are welcome to discuss and/or complain about the grading of a given assignment, be it homework, Lab grade, Short Tests or Final Exam. Any appeal will be entertained if it is raised no later than one week after the date on which the graded Exam/Lab/Tests/HW are made available for return to the class. After this "appeal period" of one week, exam grades will be considered final and will not be altered. Any appeal concerning a grade in the Laboratory should directly be discussed with your Lab. instructor.