1. Educational Goals

To learn the basic concepts of physics and apply them to a wide range of examples and applications.

2. Lectures

Lectures Monday, Wednesday, and Thursday, 1:35-2:40 in room 125 DK.

3. Instructor Information

Office: 118 Dana
Office Phone: 617-373-7323
Email: mark@neu.edu
Office Hours: Mon. 2:40-4:10, Wed. 2:40-4:10

4. Required Text

Note: There is a sixth edition of the text, but most of the students in this class used the fifth edition last year, so we will continue with that edition. DO NOT BUY THE SIXTH EDITION.

5. Homework, Exams, and Grading

Homework

The assigned reading and homework should be completed before the last lecture of the week.

Quizzes (20% of final grade)

There will be nine 20-minute quizzes based on the homework assignments from the current and previous week. The Quiz will be given at the end of the lecture on Thursday.

One one-hour midterm exam (20% of the final grade)

One two-hour final exam (40% of the final grade)

PHY U148 laboratory (20% of the final grade)

You must register for and attend the laboratory portion of this class. Information about the introductory physics laboratories can be found at [http://www.atsweb.neu.edu/physics/ipl/](http://www.atsweb.neu.edu/physics/ipl/)

The schedule on the following page gives approximate information on the topics covered in the course.
| Week 1  (8-10 Sept) | Electric Charge and Electric Field  
Chapter 16, sections 1,2,3,4,5,6.  
Electric charge, Coulomb's Law.  
Problems 2,5,12,13,14. |
|---------------------|-------------------------------------------------------------------------|
| Week 2  (13-17 Sept)  
Expt. 31: DC Electrical Measurements  
Quiz 1 | Electric Field (continued)  
Chapter 16, sections 7,8. Electric Field. Problems 26,29  
Electric Potential  
Chapter 17, sections 1,2,3,4,5,7,8,9,10. Electric potential, capacitance, dielectrics, energy storage, electrocardiogram, cathode ray tube.  
Problems 5,9,23,35,39,47. |
| Week 3  (20-24 Sept)  
Expt. 31: DC Electrical Measurements  
Quiz 2 | Electric Currents  
Chapter 18, sections 1,2,3,4,6,7,10.  
Batteries, electric current, Ohm's Law, resistors, resistivity, electric power, nervous system. Problems 1,5,9,13,23,27,28,34  
DC Circuits  
Chapter 19, sections 1,2  
Resistors in series and parallel. Problems 1,2, 8,15. |
| Week 4  (27 Sept - 1 Oct)  
Expt 33: RC Circuits  
Quiz 3 | DC Circuits (continued)  
Chapter 19, sections 3,4,5,6,7,8.  
| Week 5  (4 - 8 Oct)  
Expt 33: RC Circuits  
Quiz 4 | Vibrations and Waves  
Chapter 11, sections 1,2,3,4,5,6  
Simple harmonic motion, simple pendulum.  
Problems 1,3,8,23,34,36,53,61 |
| Week 6  (11 - 15 Oct)  
Expt. 37: Standing Waves  
Quiz 5 | MIDTERM EXAM  
Vibrations and Waves (continued)  
Chapter 11, sections 7,8,9. Wave motion, types of waves.  
Problems 36, 41,45. |
| Week 7  (18 - 22 Oct)  
Expt. 37: Standing Waves  
Quiz 6 | Sound  
Chapter 12, sections 1,2,4,5,7. Characteristics, the ear, sources, Doppler effect, shock waves, ultrasound.  
Problems 9,10,14,17,29,30,42. |
| Week 8  (25 - 29 Oct)  
Expt. 17: Simple Pendulum  
Quiz 7 | Optics  
Chapter 23, sections 1,2,3,4,5. Reflection, mirrors, refraction.  
Problems 4,15,27,35,37. |
| Week 9  (1 - 5 Nov)  
Expt. 17: Simple Pendulum  
Quiz 8 | Optics (continued)  
Chapter 23, sections 6,7,8,9,10.  
Total internal reflection, fiber optics, lenses.  
| Week 10  (8 - 12 Nov)  
Expt. 23: Geometric Optics  
Quiz 9 | Optical Instruments  
Chapter 25, sections 1,2,3,4,5.  
Camera, the eye, magnifying glass, telescope, microscope.  
Problems 2,9,11,25,33,43 |
| Week 11  (15 - 19 Nov)  
Expt. 23: Geometric Optics  
Quiz 10 | Nuclear Physics and Radioactivity  
Chapter 30, sections 1,3,4,5,6,7,8.  
Atomic nucleus, radioactivity, conservation of nucleons, half-life.  
Problems 4,5,20,25,30,35. |
| Week 12  (22 Nov)  
Makeup Experiments | Nuclear Physics and Radioactivity (continued)  
Chapter 30, sections 10,11,13.  
Decay series, radioactive dating, detectors. |
| Week 13  (29 Nov - 3 Dec)  
Expt. 40: Radioactive Decay | Effects and Uses of Radiation  
Chapter 31, sections 1,2,3,4,5,6,7,8,9. Nuclear reaction, fission, fusion, radiation damage, dosimetry, radiation therapy, tracers, PET, MRI. |
| Week 14  (6 - 8 Dec)  
Expt. 40: Radioactive Decay | Review |
| Week 15  (13 - 17 Dec) | FINAL EXAM |