

AP Physics C

This course ordinarily forms the first part of the college sequence that serves as the foundation in physics for students majoring in the physical sciences or engineering. The sequence is parallel to or preceded by mathematics courses that include calculus. Methods of calculus are used wherever appropriate in formulating physical principles and in applying them to physical problems. The subject matter of the C course is principally mechanics, and electricity and magnetism, with approximately equal emphasis on these two areas.

Textbook

Young, Hugh D. and Roger A. Freedman, *University Physics*, 9th ed. Reading, Mass.: Addison Wesley Longman, 1996.

Course Syllabus

I. Newtonian Mechanics (Fall Semester)	50%
A. Kinematics (including vectors, vector algebra, components of vectors, coordinate systems, displacement, velocity, and acceleration)	9%
1. Motion in one dimension	
2. Motion in two dimensions including projectile motion	
B. Newton's laws of motion (including friction and centripetal force)	10%
1. Static equilibrium (first law)	
2. Dynamics of a single particle (second law)	
3. Systems of two or more bodies (third law)	
C. Work, energy, power	7%
1. Work and work-energy theorem	
2. Conservative forces and potential energy	
3. Conservation of energy	
4. Power	
D. Systems of particles, linear momentum	6%
1. Center of mass	
2. Impulse and momentum	
3. Conservation of linear momentum, collisions	
E. Circular motion and rotation	9%
1. Uniform circular motion	
2. Angular momentum and its conservation	
a. Point particles	
b. Extended bodies including rotational inertia	
3. Torque and rotational statics	
4. Rotational kinematics and dynamics	
F. Oscillations and gravitation	9%
1. Simple harmonic motion (dynamics and energy relationships)	
2. Mass on a spring	
3. Pendulum and other oscillations	
4. Newton's law of gravity	
5. Orbits of planets and satellites	
a. Circular	
b. General	

II. Electricity and Magnetism (Spring Semester) 50%

- A. Electrostatics 15%
1. Charge, field, and potential
 2. Coulomb's law and field and potential of point charges
 3. Fields and potentials of other charge distributions
 - a. Planar
 - b. Spherical symmetry
 - c. Cylindrical symmetry
 4. Gauss's law
- B. Conductors, capacitors, dielectrics 7%
1. Electrostatics with conductors
 2. Capacitors
 - a. Parallel plate
 - b. Spherical and cylindrical
 3. Dielectrics
- C. Electric circuits 10%
1. Current, resistance, power
 2. Steady-state direct current circuits with batteries and resistors only
 3. Capacitors in circuits
 - a. Steady state
 - b. Transients in RC circuits
- D. Magnetostatics 10%
1. Forces on moving charges in magnetic fields
 2. Forces on current-carrying wires in magnetic fields
 3. Fields of long current-carrying wires
 4. Biot-Savart and Ampere's law
- E. Electromagnetism 8%
1. Electromagnetic induction (including Faraday's law and Lenz's law)
 2. Inductance (including LR and LC circuits)
 3. Maxwell's equations

Reference

Please refer to the following website for the above and additional information concerning the course and related AP Exams.

<http://apcentral.collegeboard.com/>

All class notes and homework assignments can be accessed at **<http://www.meitz.weebly.com>**.

Grading

Your grade for this class is determined from grades taken on homework, in-class activities, and tests. Your six-week average is determined using the following weighted-average:

Tests	60%
Quizzes	30%
Homework	10%