

## A.P Physics C – Both Courses

**Instructor:** Mr. Duda, E426

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**Overview:** Concepts are emphasized, along with their applications to problem-solving using vector notation, vector products, trigonometric functions, and calculus. Each student must have access to a scientific or graphing calculator. The course follows the prescribed Advanced Placement Curriculum.

**Texts:** Fundamentals of Physics by Halliday, Resnick & Walker (classroom set)  
5 Steps to a 5. Review (this one is yours to keep)

**WebAssign:** [webassign.net](http://webassign.net) An account will be given for each student (no cost). Students must complete problem sets for each unit.

**Schedule:** The class meets 7 periods per cycle in a six-day cycle (including one double-lab period). Be sure to attend your lab period!

**Grading:** The quarterly grade is based on summative tests (80%), labs, quizzes and other formative grades (20%) There will be a final exam as well (no midterm).

Tests cover units, rather than chapters. They are comprised of multiple-choice and free response problems that approximate the AP Exam format and difficulty level. An AP physics formula sheet and calculator will be available for your use during both portions of tests.

1 test retest may be done each semester. Follow usual Wilson retest policy. These must be done in class, during a designated day that will follow a few days after the original test.

Lab data, analyses and conclusions are done through graded written formal lab reports. Some labs will not require a full length report, but only completion of the lab procedure, calculations, and questions. Some labs may have a short quiz on the following day. No redo for labwork.

There will be plenty of class time for teacher help in addition to any work outside of school for the completion of the web assign problem sets. Activity period is often a good time for help. For each problem set, there will be an in class assessment that will consist of 1 or more of those problems directly from webassign that students must complete individually in class (about 15 minutes). No retakes for these. Ideally students will complete the problem sets and understand them well enough to score very well on the “quizzes”.

**The AP Test:** It is strongly encouraged but optional that you take the AP test.

**Phones:** All phones in backpack, usually Wilson policy.

**Come to class on time, prepared with materials, and ready to participate. A proper philosophy, good attitude, and strong work ethic are necessary for success in AP physics!!!**

## Newtonian Mechanics

### A. Kinematics

1. Motion in one-dimension
2. Motion in two-dimensions, including projectile motion

### B. Newton's Laws of Motion

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

1. Work and work-energy theorem
2. Conservative forces and potential energy
3. Conservation of energy
4. Power

### D. Systems of Particles, Linear Momentum

1. Center of mass
2. Impulse and momentum
3. Conservation of linear momentum, collisions

### E. Circular Motion and Rotation

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

1. Simple harmonic motion (dynamics and energy relationships)
2. Mass on a spring
3. Pendulum and other oscillators
4. Newton's Law of Universal Gravitation
5. Orbits of planets and satellites
  - a. Circular
  - b. General

The following labs are typically completed for Electricity and Magnetism. These represent the units covered.

- Static Charge and Interactions
- Gauss' Law Simulation
- Electric Field Lines and Equipotential Surfaces
- Ohm's Law for Linear and Nonlinear Devices
- DC Circuit Analysis
- Resistivity
- Capacitors in Series and Parallel
- Charge Buildup and Decay in Capacitors
- The RC Time Constant
- Magnetic Field Lab
- Magnets and Coil Exploration
- Mass of the Electron