



COVINGTON LATIN SCHOOL

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AP PHYSICS I

Textbook:

- *Holt Physics*
- by Serway, Faughn
- Holt, Rhinehart, Winston
- 2009

Prerequisites:

- Completion of Algebra II, Biology and Chemistry

Course Description:

This course will prepare a student for College Level Physics classes, whether as a major, or as a corequisite for a major in a related discipline (Chemistry, Biology, Math, etc.). Physics deals with matter and energy (every natural, created thing). This course will limit itself to the study of Classical (Newtonian) Mechanics (motion, forces & energy), basic Fluid Mechanics, basic Vibrations and Waves, and Electro-Magnetic Energy. If time allows, Optics, Atomic Physics and basic Relativity will also be considered. A large component of this course will be thinking about the world from a mathematical perspective and gaining facility in doing so. Thus, mathematical problem solving is emphasized over verbal conceptualization.

Course Goals:

1. Help students to gain an in-depth understanding of how things work and how they work together.
2. Help students understand that how things work is basically guided by mathematical principles that can be discovered through research, effort and practice.
3. Enable students to successfully complete a college course in Physics.

Course Objectives:

The students will be able to:

1. Describe and predict the motion of an object given certain initial conditions.
2. Analyze the forces acting on an object in order to describe and predict its motion (or lack thereof).
3. Analyze the forces acting in a fluid in order to describe and predict its motion (or lack thereof).
4. Analyze the forces acting in an object (heat) in order to describe and predict its behavior.
5. Analyze and describe the nature and behavior of electromagnetic energy and its effect on things.
6. Understand that all is not as it appears, and that there is much yet to be discovered about the nature of matter.

Course Sequence:

- Kinematics
- Dynamics: Newton's Laws
- Impulse, Momentum and Conservation of momentum
- Work, Energy and Conservation of Energy
(Semester Exam)
- Circular Motion and Universal Law of gravitation

- Rotational Motion
 - Torque
 - Rotational Kinematics
 - Rotational Energy
 - Rotational dynamics
 - Conservation of angular momentum
- Simple Harmonic Motion
- Mechanical Waves and Sound
- Electrostatics
 - Electric Charge
 - Electric Force
 - Electric Fields
- DC circuits

(End of AP Requirements. If time allows,)

- Light and Optics
- Fluid Mechanics,
- Thermodynamics
- Optics
- Atomic Physics
- basic Relativity

Evaluation:

Each assignment will be given a point value. For example, an exam might be 200 points while a test might be 100 points. Homework or quizzes are usually 5-25 points. A student's quarter grade will be calculated by dividing the points earned by the points available to have been earned.

Supplementary Materials:

Occasional Youtube videos will supplement class instruction.