

AP Physics B Syllabus

AP Physics B is designed to offer a broad view of many topics in Physics, using advanced algebra level math. The topics in the course are selected by the Advanced Placement College Board (collegeboard.com) and are designed to be the equivalent of a first year college level physics course (non-calculus based). This is a two semester course which is taught in 50 minute sessions every day, per the school's schedule. Honors Physics, the equivalent, or a special recommendation are expected of every student enrolled in the class. The course will emphasize understanding the concepts of physics using hands on laboratory activities as well as mathematical models to find relationships between objects and concepts. All students are encouraged to take the AP Physics B exam on May 12th 2014, though this will have no bearing on the grade earned for the course. Students' letter grades will be determined on the following basis:

1 st Marking Period.....	40 %
2 nd Marking Period	40 %
Semester Final Exam	20 %

In each Marking Period grades will be determined using total points. Tests and Labs are given a significantly higher weight than homework assignments.

There will be no D's in this course. The grading scale will be A, B, C, F. Students should expect to practice every night, tests at the end of each unit and labs in 1/5 or more of the lessons. The text for the class is *Physics*, Cutnell & Johnson; 7th edition, John Wiley & Sons Inc.

September 3 - 13:

Course Introduction

Vectors, Units, Scientific Method

Activity/Lab: Vector Treasure Hunt

Lab procedures

1D motion, Position, Displacement, Speed, Velocity, and Acceleration (Objective I.A.1)

Activity/Lab: Measuring the Acceleration due to gravity

Activity/Lab: "When will they pass"

2D Motion (Objective I.A.2)

Including relative motion

Projectile Motion (Objective I.A.2)

Activity/Lab: Projectile Motion

Vectors (Objective I.A.2)

Unit 1 Test

September 16 – September 27

Equilibrium (Objective I.B.1)

Newton's Laws (Objective I.B.2)

Adding Forces, Constant Forces

Forces (Objective I.B.2)

Activity/Lab: Inclined plane

Friction

Tension & Pulleys

Kinetic Energy (Objective I.C.2)

Potential Energy (Objective I.C.2)

Energy Conservation (Objective I.C.3)

Activity/Lab: Conservation of energy Lab

Simple Harmonic Motion (Objective I.F.1-3)

Work

Work – Energy Theorem (Objective I.C.1)

Power

Unit Test 2 (Forces, Work, Energy)

September 30 – October 11

Linear Momentum (Objective I.D.1-3)

Collisions

Activity/Lab: Collisions

Uniform Circular Motion (Objective I.E.1)

Torque (Objective 1.E.2)

Universal Gravitation (Objective I.F.4-5)

Angular Momentum

Unit 3 Test

Activity/Lab: Rube Goldberg

October 14 - November 1

Fluids (Objective II.A.1-4)

Pressure, Bouyancy

Activity/Lab: Buoyancy

Fluid Dynamics

Activity/Lab: Bernoulli's Principle (Show that faster moving air has lower pressure)

November 4 - November 22

Temperature and Heat (II.B.1-2)

Thermodynamics

Activity/Lab – Extrapolate to Absolute 0

Ideal Gasses + PV Diagrams

Laws of thermodynamics

Activity/Lab - Final Temperature

Unit Test 3 (Fluids + Thermodynamics)

November 25 – December 13 (Thanksgiving)

Physical Waves (IV.A.1-4)

Sound

Activity/Lab: Waves on slinkies

Activity/Lab: Speed of Sound in Air
Hooke's Law
Interference, Superposition, Diffraction (IV.B.1-2)

December 16 - January 17 (Winter Break)

Geometric Optics (IV.C.1)
Activity/Labs Mirror Ray Diagrams
Mirrors (IV.C.2)
Lenses (IV.C.3)
Activity/Lab: Lenses and focal lengths
Unit 4 Test

January 20 – 24 (MLK/Exams)

Midterm + Review

January 27 - February 7

Electrostatics
Electric Charge, Coulomb's Law (III.A.1)
Activity/Lab: Pith Ball Repulsion
Electric Field/Potential (III.A.2)

February 10 – February 21

Charging objects (III.B.1)
Conductors (III.B.1)
Capacitors (III.B.2)
Circuits (III.C.1-3)
Activity/Lab: Circuits and Ohm's law

February 24 – March 7

Magnets and Fields (III.D.1)
Forces and Fields in current carrying wires (III.D.2-3)
Activity/Lab: Fields
Electromagnetism (III.E.1)
Unit 5 Test

March 10 – April 4

Atomic Physics (V.A.1-3)
Nuclear Power (V.B.1-2)
Review for Exam, AP and regular
Final Exam

April 7 – May 9

Review

May 12th 2013 (Monday)

AP Physics B Exam

There will be two main types of hands on activities for students, in addition to demonstrations with a limited number of participants, there will be 'cookbook' labs where students are asked to follow instructions exactly to get a feel for a particular concept and inquiry based labs where students are given a problem to solve and asked to design an experiment to do so. Students will be asked to collaborate and share ideas as to the best way to solve the problem before beginning work. Once they have come up with a plan they will need to execute their designs and make observations. After carrying out the experiments students will analyze the data and consider where errors may have entered in to the data, as compared to theoretical models. Finally the students will have to present their findings to other students as well as the teacher in a combination of oral and written forms.

(Objective Lab 1-3)

Quiz and Assignment Grading policy:

Retakes: Students may retake a quiz one time if they earn less than a 75% on the quiz. They may earn up to a 75% on their retake, which will then replace their prior grade. If a student is absent on the day that the class takes a quiz, the make up quiz may contain additional problems due to the loss of instructional time. Test grades can be improved through a correction/argument process which will be outlined in class.

Late/Missing Assignments: Any assignment may be turned in up until the day after the test over that unit, with the exception of assignments which must be turned in online