

AP Physics C Course Syllabus

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Website: <http://sites.google.com/a/ccs-rams.org/echen/home>CollegeBoard AP Website: <http://www.collegeboard.com/student/testing/ap/about.html>Required Textbooks (provided by school):1) **Fundamentals of Physics (Extended 9th Edition)** *by Halliday, Resnick, Walker*Recommended Books (not required):

- 1) **The Cartoon Guide to Physics** *by Larry Gonick* **ISBN: 0-06-273100-9**
 2) **5 Steps to a 5 – AP Physics B & C 2010-2011** *by Greg Jacobs* **ISBN: 978007-162320-9**

Course Description: This class is a calculus-based college level course in physics designed to prepare students for both AP Physics C exams (Mechanics and Electromagnetism) in May 2011. Information will be presented using traditional lecture and demonstration methods along with the use of WileyPLUS online learning tools. Lab experiments will provide an opportunity to observe and measure the physics principles in reality. See the Teaching Timeline section for a more detailed outline of the class.

Supplies: You must be prepared with the following learning materials and equipment
For note-taking, data-collecting, and other written work:

Spiral Notebook (8.5x11) pen pencil and eraser

For homework, schoolwork, and exams:

Calculator (TI-30X II or better) binder paper (8.5x11) graph paper

For labs:

Lab coat Protective Eyewear

Grading scale: The CCS standard grading scale is below

97-100	A+	67-69	D+
93-96	A	63-66	D
90-92	A-	60-62	D-
87-89	B+	50-59	F
83-86	B		
80-82	B-		
77-79	C+		
73-76	C		
70-72	C-		

Classroom expectations:

Students must follow instructions at all times to maintain a safe learning environment.

Students must understand Stop-Freeze-Go, Lab Safety, and paperwork submission procedures.

In general, don't do anything that prevents other students from learning.

Late work: Paperwork submitted after due date without sufficient excuse.

There are two types of late work – soon after and long after. Soon after late work is turned in days after it is due (your score -10% for every day late). Long after late work is turned in more than a week after it is due (50% of your score). The minimum score for any paperwork (late or on time) is 25%.

Exam Policy:

Exams will be given upon completion of certain chapters. Missing assignments will be posted on PowerSchool. Students absent on an exam day will receive an automatic 25% until they arrange with the teacher when they will take the test.

Student Responsibilities:

All students will be held accountable for the information on this syllabus, in the student handbook, and PowerSchool. Policies may be added and/or changed throughout the year to better fit the class. Any disregard or violation of policy and procedure may result in academic harm due to various reasons and/or physical harm due to safety hazards. In general:

- keep yourself and fellow students safe
- value your grade and other students' grades
- do your work completely and on time

Quarter Grade Weighting:

Paperwork (homework, schoolwork, quiz)	15%
Labs (lab report, conduct, safety)	45%
Exams (Chapter Test, Unit Test)	35%

Semester Grade Weighting:

Quarter 1	45%
Quarter 2	45%
Final Exam	10%

Teaching Timeline Introduction

This is an expected outline of the AP Physics C schedule for 2010-2011. There are about 29 "normal" weeks (Aug 23-May 9) where there are no finals and students are expected to perform at full capacity. There will be "make-up" sessions scheduled for AP teachers and students to catch up on material.

AP Exam Test Date

The AP Physics C test is Monday May 9, 12noon (Mechanics) and 2pm (E&M).

Teaching Timeline**Semester 1 – Quarter 1 (Aug 23-Oct 28)**

Kinematics
Newton's Laws of Motion
Work, Energy, Power
Systems of Particles, Linear Momentum
Textbook Chapters 1-10

Labs:
Measurement, Pendulum
Galileo's experiment, acceleration due to gravity on an incline
Projectile motion, initial speed and direction
Newton's Laws, Atwood's machine

Semester 1 – Quarter 2 (Nov 1-Dec 10, Jan 3-Jan 13)

Circular Motion and Rotation
Oscillations and Gravitation
Textbook Chapters 11-12

Labs:
Friction
Hooke's Law
Circular Motion
AP practice exam (Mechanics)

Note: Semester 1 Final (Dec 15) includes circular motion, rotation, oscillations, and SHM lightly. There are 9 days of instruction dedicated to SHM in January after finals.

Semester 2 – Quarter 3 (Jan 18-Mar 25)

Electrostatics
Conductors, Capacitors, Dielectrics
Electric Circuits
Textbook Chapters 22-28

Labs:
Electrostatics, Van de Graaff generator
Circuits, Ohm's Law
Circuits, series and parallel
Circuits, RC circuits

Semester 2 – Quarter 4 (Apr 4-May 6)

Magnetic Fields
Electromagnetism
AP exam review and test taking strategies
Textbook Chapters 29-32

Labs:
Electric field detector using a FET
Magnetic fields, solenoid and coil
Magnetic induction, permanent magnet
AP practice exam (E&M)

Note: Semester 2 Final (May 25) will include all topics for E&M.

Lab List**Semester 1 (Mechanics)**

Measurement, Pendulum

Students will practice handling common pieces of lab equipment and determine how length affects the period of a simple pendulum by collecting data using a stopwatch.

Determining the acceleration due to gravity on an incline

Students will duplicate Galileo's inclined plane experiment to determine how angle of incline affects acceleration due to gravity.

Projectile motion, determining the initial speed and direction of a projectile

Students will use vertical and horizontal displacement to calculate initial speed of a projectile launched at various angles.

Newton's Laws, determining an unknown mass using a modified Atwood's machine

Students will determine the mass of an object using a known mass and gravity.

Friction, determining the coefficient of static friction

Students will determine the coefficient of static friction of various objects on an inclined plane.

Hooke's law, determining the force constant of a spring

Students will determine the spring constant (k) of several unknown springs.

Circular motion, simple harmonic motion and pendulums

Students will compare describing circular motion in Cartesian and polar coordinates.

Semester 2 (Electricity and Magnetism)

Electrostatics, investigation and discovery with the Van de Graaff generator

Students will determine electric charge of a Van de Graaff generator using temporarily charged objects (static electricity).

Circuits, using electric circuits to verify Ohm's Law

Students will construct simple resistor circuits and measure potential differences between points on the circuit to verify Ohm's Law.

Circuits, series and parallel circuits

Students will construct resistor circuits in series and parallel and determine how each design affects current and potential difference.

Circuits, RC circuits and stored charge

Students will construct circuits using resistors, capacitors and switches to observe stored charge and calculate time constants.

Electric Field Detector using a FET

Students will construct a simple electric field detector using a field effect transistor and LED.

Magnetic Fields, determining magnetic field in a solenoid and a coil

Students will measure and calculate the strength of a magnetic field around a solenoid and coil.

Magnetic Induction, determining affect of permanent magnet EMF on electric current

Students will observe and measure the effect of an external magnetic field on current.

Expansive, alternative, or backup labs

1. Physical resistance, determining resistance of copper wire of various dimensions (mostly length).
2. Net force, vectors, describing component forces and net force in terms of vectors (force table).
3. Physics Day at Great America, conservation of energy, gravity, rotational motion, acceleration.