La Costa Canyon High School

Science
AP Physics C

Level of Difficulty	Estimated Homework Time	Prerequisites
☐ Moderate ☐ Difficult **X Very Difficult**	**60 minutes per day*** *This is a general guideline for planning and scheduling purposes. A student's ability level may affect actual preparation time needed.	<u>**District**</u> The ability and academic background to complete college level work <u>**Department**</u> B or better in Physics Completion of Calculus Please see student background expectations

<u>Course Description</u>

Course will cover Classical Mechanics and Electromagnetism. This course is taught with the assumption that students have a strong background in high school physics. Students will focus on problem solving of university-level physics problems. The pace of the course will be rapid with the assumption of knowledge of fundamental physics. Calculus will be used extensively.

Students will explore these topics through discussions, laboratory investigations, teacher demonstrations, and in-class assignments. This course is aligned with the California State Standards in Physics as well as the guidelines described by College Board.

<u>Student Background</u>

A student entering AP Physics C should be able to:

  7th grade Science Investigation and Experimentation Standards:

- Select and use appropriate tools and technology (including calculators, computers, balances) to perform tests, collect data, and display data.
- Use a variety of print and electronic resources (including the internet) to collect information and evidence as a part of a research project.
- Communicate the logical connection among hypotheses, science concepts, tests conducted, data collected, and conclusions drawn from the scientific evidence.

- Communicate the steps and results from an investigation in written report and oral presentations.
- 8th grade Science Investigation and Experimentation Standards:
- Plan and construct a scientific investigation to test a hypothesis.
- Construct appropriate graphs from data and develop quantitative statements about the relationships variables.
- Apply simple mathematical relationships to determine a missing quantity in a mathematic expression, given the two remaining terms (including speed=distance/time, density=mass/volume, volume=area x height)
- 9th-12th Science Investigation and Experimentation Standards:
- Formulate explanations by using logic and evidence.
- Distinguish between hypothesis and theory as scientific terms.
- Identify possible reasons for inconsistent results, such as sources of error or uncontrolled conditions.
- Analyze situations and solve problems that require combining and applying concepts from more than one area of science.
- Solve scientific problems by using quadratic equations and simple trigonometric, exponential, and logarithmic functions.
- Identify and communicate sources of unavoidable experimental error.

Algebra 1 Standards:
- Interpret and use ratios in different contexts to show relative sizes of two quantities, using appropriate notations.
- Graph linear functions, noting that vertical change (change in y-value) per unit of horizontal change (change in x-value) is always the same and know that the ratio is called the slope of a graph.
- Students apply algebraic techniques to solve rate problems, work problems and percent problems.
- Identify and use the arithmetic properties of subsets of integers and rational, irrational, and real numbers, including closure properties for the four basic arithmetic operations where applicable.
- Understand and use such operations as taking the opposite, finding the reciprocal, taking a root, and raising to a fractional power.
- Students simplify expressions before solving linear equations and inequalities in one variable, such as $3(2x-5) + 4(x-2) = 12$.
- Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step.
- Solve a system of two linear equations in two variables algebraically and are able to interpret the answer graphically.
- Solve a quadratic equation.

Geometry/Trigonometry Standards:
- Use Pythagorean theorem.
- Solve problems involving the perimeter, circumference, area, volume, lateral area,
- surface area of common geometric figures.
- Use trigonometry functions to determine x and y components of a triangle given the

- answer.

Algebra 2 Standards:
- Students understand the inverse relationship between exponents and logarithms and
- use this relationship to solve problems involving logarithms and exponents
- Calculus Standards College Board Requirements:
- Students can use calculus in formulating principles and solving problems (student should be able to take derivatives and integrals for a variety of mathematical functions)

Grading

The grading system is based on weighted percentages. Each assignment will have a point value and be weighed according to the category it falls under. Individual teachers may make slight modifications on the weighted percentages.

Links

CollegeBoard http://www.collegeboard.com
CA State Science Standards http://www.cde.ca.gov/stadards
Science Framework for California Public Schools
http://www.cde.ca.gov/re/pn/fd/sci-frame-dwnld.asp

Additional Information for Students/Parents
- 10 credits
- Meets high school graduation requirement for physical science or elective credits Meets UC/CSU subject area "d" requirement
- Weighted grade