Course Description for AP Physics C at B-CC

Aims/Objectives of the Course

The goal of AP Physics C is to replicate a two-semester, first-year college physics course series for science or engineering majors. In many colleges and universities, science and engineering majors must take a "Physics 101" and "Physics 102" course. The high school AP Physics C course covers the same content, with the same difficulty, while emphasizing laboratory experiments.

The AP Physics C course builds upon the introductory, algebra-based Honors Physics course. Students in AP Physics C will learn how to add calculus into their physical models, and to analyze more complex systems than what is encountered in Honors Physics. Because the AP Physics C course moves quickly, students will need to be familiar with most of the concepts at an introductory level before the course begins. Therefore, a pre-requisite for taking AP Physics C is the completion of Honors Physics.

The AP Physics C course at B-CC currently uses the Young & Freedman University Physics textbook, which is also one of the most commonly used physics textbooks at the college level.

Course Content

The first part of the course covers mechanics, which includes velocity, acceleration, and the forces that cause acceleration. Non-constant forces are analyzed, as well as air resistance. Other topics in mechanics include energy, momentum, gravitation, oscillatory motion, and rotational motion.

The second part of the course covers electricity & magnetism. Topics covered include electric forces, electric fields, Gauss's Law, magnetic forces, magnetic fields, induced currents, voltage, current, series/parallel circuits, capacitors, dielectrics, resistors, transformers, and inductors.

Structure of the AP Physics C Exam

Students who complete the AP Physics C course will be expected to take two separate*, 90-minute AP Exams. The first exam covers Mechanics only. The second exam covers Electricity & Magnetism only. Each exam contains a 45-minute multiple choice section and a 45-minute free response section. Both sections are weighted equally.
**Students must register for each exam separately and pay for two full AP exam fees.*

The Difference Between IB Physics and AP Physics C

The next page summarizes the differences between IB Physics and AP Physics at B-CC, and addresses some common questions students and parents often have when deciding between the two courses.

Course	IB Physics at B-CC	AP Physics C at B-CC
Duration	2 yr course – students must take both yrs (B-CC students should **NOT** take Honors Physics as sophomores at all if they intend to take IB Physics as juniors)	1 year course (Students must take Honors Physics first, during either sophomore or junior year)
Grades	IB Year 1 = only juniors IB Year 2 = only seniors usually only full-IB Diploma students	95% seniors, 5% juniors, approx.
Math used	Algebra I & Geometry some right-triangle trigonometry no calculus at all	Calculus, with algebra & geometry (Must have either completed or be currently enrolled in AP Calculus)
Number of topics	Very broad number of topics. Brief coverage of each topic. Mostly classical physics, with some modern physics too (physics from the years 1600-2010, including the Higgs Boson!) Mechanics, E&M, waves, light, sound, heat, radioactivity, nuclear, alternative energy sources, particle physics, quantum physics, relativity, astrophysics, Big Bang	Very narrow number of topics. More in-depth coverage of each topic. Classical Physics (1600-1890) only Advanced Mechanics (with rotations), Advanced Electricity & Magnetism ("E&M"), using Maxwell's equations
Types of problems	Often answered with sentences. Explaining main ideas /concepts. Simple math problems. Drawing graphs or diagrams is common.	Heavy mathematical analysis. Multi-step problems in free-response.
Exam format	3-part exam at the end of the second year. Total of 270 minutes Paper 1: all multiple-choice, 60 minutes Paper 2: free response on core, 135 mins Paper 3: free response options, 75 mins	2 separate exams, total of 180 minutes (must register and pay for 2 full AP exam fees) 90 minute Mechanics exam; 90 minute E&M exam Each 90 minute exam is made of a 45-minute multiple choice & a 45 minute free response
IB/AP Score	IB Score of 1-7. Only 1 score for the entire 2 -year course. IB Score is determined : -75% of the grade is from the IB exam -25% from an in-class project (the IA)	AP score of 1-5. Each exam is scored separately, so students will get 2 AP scores. AP Score is 100% based on exam.
College Credit (all colleges are different)	Many colleges grant the equivalent of 2 courses (8 credits) of freshman-level physics for a qualifying IB Physics score. Usually a score of 5,6, or 7 is required.	Many colleges grant the equivalent of 2 courses (8 credits) for scores of 4 or 5 on both AP Physics C exams. It is often possible to earn 4 credits for a high score on 1 exam only.