

## 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 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.

<b>Course</b>	<b>IB Physics</b>	<b>AP Physics C</b>
<b>Duration</b>	2 yr course – students must take both yrs (B-CC students should do 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)
<b>Grades</b>	IB Year 1 = all juniors IB Year 2 = all seniors	95% seniors, 5% juniors, approx.
<b>Math used</b>	Algebra I & Geometry only	Calculus, with algebra & geometry (Must have either completed or be currently enrolled in AP Calculus)
<b>Number of topics</b>	Very broad number of topics. Brief coverage of each topic. Mostly classical physics, with some modern physics here and there.  Mechanics (no rotations), E&M, waves, light, sound, heat, radioactivity, nuclear, alternative energy sources, greenhouse effect, global warming, fossil fuels, quantum physics, relativity, astrophysics, stellar evolution, Big Bang	Very narrow number of topics.  More in-depth coverage of each topic.  Classical Physics (1600-1890) only  Mechanics (with rotations),  E&M, Maxwell's equations
<b>Types of problems</b>	Often answered with sentences. Explaining main ideas /concepts. One-step problems. Drawing graphs or diagrams is common.	Conceptual questions with heavy mathematical analysis. Solving for unknown quantities. Multi-step problems in free-response.
<b>Exam format</b>	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 different 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
<b>IB/AP Score</b>	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 in-class labs & projects	AP score of 1-5. Each exam is scored separately, so students will get 2 AP scores. AP Score is 100% based on exam.
<b>College Credit</b> (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 usually possible to earn 4 credits for a high score on only 1 exam.