

AP Physics C: Mechanics and Electricity and Magnetism

Wando High School

2017-2018

Instructor: Nathan Belcher

Email: nathan_belcher@charleston.k12.sc.us

School Phone: 843.881.8200 x27316

Office Hours: TR 7:45-8:15

Website: nathantbelcher.com/ap-physics-c

Textbooks: *Matter and Interactions*, 4th Edition, Chabay and Sherwood; *Physics for Scientists and Engineers*, 4th Edition, Knight

Course Description: AP Physics C is two courses: Mechanics and Electricity and Magnetism. These calculus-based courses normally form the college sequence that serves as the foundation in physics for students majoring in the physical sciences or engineering. The aim of these courses is to develop students' abilities in the following areas:

- Read, understand, and interpret physical information – verbal, mathematical, and graphical;
- Describe and explain the sequence of steps in the analysis of a particular phenomenon or problem;
- Use basic mathematical reasoning—arithmetic, algebraic, geometric, trigonometric, or calculus—in a physical situation or problem; and
- Perform experiments and interpret the results of observations, including making an assessment of experimental uncertainties.

Policies on Attendance, Make-Up Work, Tardies, and Dress Code: Students are expected to follow all school and school district policies.

Laboratory Activities: The laboratory experience is important in helping students understand the topics being considered, and students will write informally and formally about their laboratory experiences. The writings will be kept in your binder, which will become a lab portfolio at the end of the course. There should also be a digital version of each lab that you perform, whether that is a full document or a picture of your work. Through the laboratory experiences, students should be able to:

- Design experiments;
- Observe and measure real phenomenon;
- Organize, display and critically analyze data;
- Analyze sources of error and determine uncertainties in measurement;
- Draw inferences from observations about data; and
- Communicate results, including suggested ways to improve experiments and proposed questions for further study.

Modeling Instruction: This course uses a teaching technique known as Modeling Instruction. This technique changes the course such that students perform a laboratory activity before defining vocabulary or performing calculations; this allows students to create a lab with available equipment, use multiple representations to explore the data, and use mathematics to draw conclusions from the data. After the opening laboratory activity, students develop a mental model of the physics principle. Students refine their mental model by identifying representations of the physics principle, perform calculations with relevant mathematics, and test aspects of the model with more experiments. The process of creating and refining mental models is known as a modeling cycle; students perform modeling cycles for information in mechanics and electricity and magnetism.

Materials Needed: A binder, loose-leaf paper, scientific calculator, pencils, and other writing utensils.

Grades: The grading policy states that all students will take the final exams except seniors with a 90 or above.

Quarter Grades	50% Tests, 30% Labs, 20% Daily Work (Quizzes and Classwork)
Semester Grade	40% First Quarters, 40% Second Quarters, 20% Final Exam

AP Physics C: Mechanics Course Outline

Unit Number	Unit Topics	Dates
1	Constant Linear Velocity, Constant Angular Velocity, Uniform Linear Acceleration, Uniform Angular Velocity, 2-D Motion	8/17 – 9/11
2	Linear Momentum, Angular Momentum	9/12 – 10/2
3	Balanced Force, Unbalanced Force	10/3 – 10/25
4	Balanced Torque, Unbalanced Torque	10/26 – 11/8
5	Energy-Work-Power	11/9 – 12/1
6	Oscillations, Gravitation	12/4 – 12/14
Exam	All	12/15 – 12/19

AP Physics C: Electricity and Magnetism Course Outline

Unit Number	Unit Topics	Dates
1	Electrostatics	1/4 – 2/2
2	Electric Potential and Magnetic Fields	2/5 – 2/22
3	Resistors, Capacitors, and Circuits	2/23 – 3/13
4	Magnetic Force	3/14 – 3/29
5	Electromagnetism	4/9 – 5/1
Exam	All	TBD

AP Exams: Since AP Physics C: Mechanics and AP Physics C: Electricity and Magnetism are distinct courses, there is an AP exam for each one. The test format is summarized below:

Section	Questions	Time (Minutes)
Multiple Choice	35	45
Free-Response	3	45

AP Exam Review: May 2 – May 11

AP Exams: May 14 (Mechanics at 12pm, Electricity and Magnetism at 2pm)