

4419 - AP Physics C

Mr. Grams

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Course Description

AP Physics C is designed at a mathematically advanced level to provide in-depth study of the two cornerstone topics of classical physics: Mechanics and Electricity & Magnetism. It includes a strong hand-on laboratory component. Calculus is used throughout the course in derivations, problem solutions, and in laboratory work. The Mechanics part of the course includes study of kinematics, forces, work, energy, and momentum, oscillations, and gravitation. The Electricity and Magnetism part explores topics such as electrostatics, electric circuits and circuit elements, and electromagnetism. A final exam or project may be given. All students enrolled in this course are encouraged to take two Physics C Advanced Placement Examinations (Mechanics and Electricity & Magnetism) in May.

Course Topics

Topic	Description
Kinematics	SI System, motion in one and two dimensions, vector addition and subtraction
Newton's laws	Forces, Newton's laws of motion for one and two-body systems, friction, drag
Circular motion	Centripetal force and acceleration
Work and energy	Work, kinetic and potential energy, conservation of energy
Linear momentum	Center of mass, impulse, conservation of linear momentum
Rotation	Static equilibrium, torque, Newton's laws for rotational systems, rolling, angular momentum

SHM and gravitation	Simple harmonic oscillators, Newton's law of universal gravitation, orbital motion, conservation of energy and angular momentum
Electric force & field	Behavior of charged particles, Coulomb's law, determination of the electric field, Gauss's Law
Resistance & circuits	Kirchoff's laws, Ohm's law, DC resistor circuits, use of multimeters, electric power and energy
Electric potential and capacitance	Electric potential energy and potential difference, capacitance, capacitor circuits and RC circuits
Magnetism	Determination of the magnetic field, electromagnetic induction, inductance and LR circuits, Maxwell's equations

Materials

Have for every class:

- your current unit packet
- scientific or graphing calculator
- notebook/binder
- pen or pencil

Have at home:

- your textbook: Physics for Scientists and Engineers, 10th Ed., Serway
- ruler
- protractor
- color pencils (red, blue, orange, green, and yellow)

General Expectations

At all times, students are expected to follow the rules, policies, and codes of conduct as outlined in the LHS Student Handbook. Please review the [Student Handbook Part VIII](#) on academic integrity.

Homework

Homework is assigned on a regular basis and posted in our Google Classroom. You are responsible for checking for any assigned homework and other assignments and contacting me if you have any questions.

Homework will be mostly assigned from the unit packets and regularly checked on completion. Homework is due at the beginning of the next class, unless specified otherwise. Late homework may receive no credit. Homework/classwork quizzes will be given.

If you experience difficulty with completing homework, I will be happy to answer your questions in person. In addition to that, homework solutions will be regularly posted for you to reference. You are expected to put your best effort into completing homework on your own or in a study group.

Assessments and Grades

A test will be given at the end of each unit. Unit tests will include both multiple-choice questions and free-response problems – a format similar to that of AP Physics C exams. Tests will be announced at least three days in advance. If you receive a score lower than 78% on a unit test, you will be eligible for retaking it. If the retake score is higher than the original test score, it replaces the original test score. If the retake score is lower than the original test score, the retake score will be dropped.

Important! Bring your own calculator to use during tests or quizzes. Sharing calculators will not be allowed. You should also have a pencil with an eraser and your student ID number.

Yearly grades are based on quarterly grades (Q1 24%, Q2 24%, Q3 24%, and Q4 18%) and the final project grade (10%). The quarterly grades are based on the following components:

Tests - 60%

HW - 20%

Labs - 20%

Labs

This course includes a strong laboratory component that is important for your understanding of physics concepts. Labs may need to be completed or finished as homework.

Labs are to be completed in groups. When completing a lab, you will be required to record your observations, show all your calculations, and answer analysis questions.

Important! *You will be working in lab groups. Within your group, you collect experimental data and discuss lab results with your partners. However, you are responsible for preparing and submitting your own lab report. **You cannot share any part of your written report with anyone from your class. No copies of other students' work will be accepted. That includes any electronic documents and charts created in Google Sheets.** If you missed a part of a lab, you cannot copy the missing data from your lab partners. Instead, you will have to schedule a lab make-up and obtain the missing data independently.*

Written work

All written work submitted for grading should have your full name and full names of your partners (if applicable).

Late written work policy: you will lose 10% of the grade for each day overdue up to a 50% of the maximum deduction (after 5 days).

Absences and make-up work

If you are absent, you are responsible for obtaining and completing any missed assignments without delay. Prior to your return to class, you are expected to check the APC Google Classroom and the assignment chart and schedule any necessary make-ups/extensions with me via email. For a planned absence, you should contact me in advance and check on the work that you will miss.

Missed tests, labs, and HW quizzes should be completed within one week from your return to class. Extended absences might require a meeting with me to develop a make-up plan.

Additionally, please review the LHS Absence and Make-up Policy in the LHS Student Handbook .

Electronic Devices

Students are expected to keep their cell phones and any other personal electronic devices on silent/off. At the beginning of each class, all phones should be placed into their assigned holders in the class cell phone wall holder. When a lesson requires a computer, students are expected to use their LHS-issued Chromebooks. Any use of electronic devices in class should be approved by the teacher.

Extra Help/ Support Available

Assignments and study materials such as slide sets and HW solution sets are posted regularly on our Google Classroom website. Extra help is available during I block and upon request during mutually convenient time.