

Classical High School

AP Physics 1

Syllabus

Instructor: Mr. Butler

Text: "Physics" 6th Edition Author: Giancoli

Prerequisite: Completion of Algebra II w/minimum grade B minus

Required Materials: Textbook, Scientific Calculator, Slot Folder, Pencils/Notebook

Website: Physica.cloud

Course Description

AP Physics 1 is a full year, introductory physics course designed to present students with the opportunity to study physics at the college level. The application of Algebra I and II, depth of concept development, pace of topics covered, and inquiry-based lab experiments combine to give students the experience of learning physics principles as they would be presented in a first year college or university physics course. This course is designed to introduce students to fundamental physics concepts in a sound and rigorous manner while preparing them to successfully complete the AP Physics B Exam in May. This course will follow the newly designed AP Physics 1 curriculum outlined in the full course description found at AP Central.

Major Areas of Study

1D and 2D Kinematics

Dynamics: Newton's Laws

Circular Motion

Work and Energy

Gravitation w/Kepler's Laws

Impulse and Momentum

Rotational Kinematics and Dynamics

Simple Harmonic Motion

Course Goals

- 1) Prepare the student to achieve a high score on the AP Physics 1 exam.
- 2) Develop students' critical thinking skills and systematic problem solving strategies through the analysis of a wide variety of physical phenomena.
- 3) Teach the student to make careful observations, think beyond the obvious, question information, analyze and interpret data, recognize physical patterns and relationships and observe natural phenomena with new insight.
- 4) Provide opportunities for experimentation and experience in validating claims and conclusions using fundamental physical laws and principles.

Evaluation

Quarter

Tests 60 %

Laboratory 20 %

AP Exam Prep 20 %

Midterm

1st Quarter 40 %

2nd Quarter 40 %

Midterm Exam 20 %

Final

Final Exam 10 %

Quarter Grades 80 %

Midterm Exam 10 %

Summer Reading

During the summer break students will read one book that relates to the science and nature of physics. Below is listed the book students should read this summer. An assessment covering the material from the book will be given during the first quarter.

Mad About Physics, F. Potter (Waived for Summer 2021)

Tests: At least one assessment will be given for each major topic covered. The tests will focus on assessing student knowledge and understanding of underlying and foundational principles and the application of those principles. Tests typically consist of questions of a conceptual nature given in a multiple choice format and/or those involving application of the principles through problem solving.

Retests: Retests are provided to students who receive a failing test grade on the first attempt. In order to take advantage of the retest option, the student must use the concept correlation formative assessment tool provided by the instructor. The student must also revisit/re-learn the concepts and principles for which their understanding was weak. The highest grade after retest will be a 70.

Retests are given only after:

- (1) a review of test questions and answers with instructor to identify concepts of weakness.
- (2) the student revisits and restudies specific course material for which their understanding was weak.
- (3) completion of a Concept Correlation identifying specific places within the resources where “missed” concepts and principles may be found.

Concept Correlations

As per College Board protocol, test questions are not released and students may not copy test questions in any way. After test results are returned, students have the opportunity to review the test questions and answers with the instructor. The instructor will provide feedback to explain the questions and answers. These test review sessions are valuable to support students in identifying and understanding “missed” concepts. A “concept correlation” is provided to students who receive a failing test grade and identifies the concept, principle or application of each test question. Students correlate questions they missed on the test with the items on the concept correlation sheet. The concept correlation serves as an individual study guide identifying concepts to revisit for deeper understanding.

Absences

Due to the amount of material and pace with which it is covered, students who are absent can easily fall behind. The student is responsible for any assignments missed/owed during an absence. On the day the student returns from an absence, it is the student’s responsibility to check with team partners and gather materials that were handed out in class on the day(s) of their absence and to be aware of assignment due dates.

Make-Up Policy

Tests/Retests: Students who are absent on the day of a test/retest may make up that test/retest in an alternate version on the day they return to school, provided the absence is excused. No test/retest make-up is allowed for an unexcused absence.

Labs: Due to the time involved in lab preparation, setup, and break-down, a make-up for a lab may not always be possible. In this case, an alternate assignment related to the lab will be assigned.

Due Dates

**The importance of assignment due dates cannot be overemphasized.
Meeting assignment due dates promotes a greater level
of retention and success by affording the following:**

- (1) receive timely feedback regarding strengths and weaknesses gauged to concept understanding and application**
- (2) keep pace with the course so as not to fall behind on course material**
- (3) ensure timely preparation for tests and retests**

Be aware that late assignments will be accepted with reduced credit!

AP Exam Prep

Formative assessments

Homework-Assignments

This is an advanced course taught at the college level! The pace at which topics are covered in this course is extremely fast! The student should expect to devote the requisite amount of time each day engaged in working on physics assignments. The student is expected to complete the required assignments daily in order to keep pace with the presentation of course material and to be prepared for the next class. Additional time may be necessary when preparing for tests, midterm/final exams, or completing a lab report.

AP Classroom (Questions/Problems)

Online multiple choice and free-response questions are designed to provide the student with valuable opportunities to apply the principles covered in class. They are an important and essential component of the learning experience in physics. Successful understanding and application of the physics principles depends to a large extent on devoting adequate time solving and answering the assigned problems and questions. Solutions to the concept apps are provided for students to self-assess and gauge their level of understanding.

Focus Questions

Focus Questions: At the beginning of each class a question will be posed to check for understanding and activate prior knowledge and critical thinking. These focus questions involve material related to current concepts or upcoming topics and serve as quiz-type formative assessments to help students gauge their own level of understanding.

Concept Apps: To deepen understanding, each topic covered will include resources that supplement the textbook readings and provide additional opportunities for the student to apply the physical principles they are learning. Class time is often made available for students to work on these activities in cooperative learning groups. Solutions to the concept apps are provided for students to self-assess and gauge their level of understanding.

Laboratory

Conducting laboratory experiments and writing scientific laboratory reports are an integral part of the AP Physics course. Approximately 20% of instructional time is devoted to doing laboratory work. This includes pre-lab discussions, designing and setting up lab apparatus and equipment, running the labs and collecting experimental data and class discussion of lab results. In this AP Physics course, laboratory experiments have been designed primarily to test and verify those laws and principles which are being covered in class. In addition, it is hoped that through these laboratory investigations, students will acknowledge for themselves the significance of those laws and principles as being the fundamental means by which we account for and explain natural phenomena.

Groups of three or four students will be assigned to conduct laboratory experiments and to collect the experimental data. Lab partners are encouraged to discuss their observations and results and to work cooperatively to interpret those results. However, each student is responsible for writing his/her own lab report. This includes generating graphs, doing computations/calculations and developing/writing conclusions...It is assumed that the lab report will be a product involving individual creativity! A laboratory report format will be given to you by your instructor. This format will outline the method for writing lab reports.

Summer Assignment

Algebra Review: To start the year on a solid mathematical footing, all students will read and complete the assignments in **Quick Algebra Review: A Self-Teaching Guide, Second Edition** by *Peter Selby and Steve Slavin*. This book helps students initially learn or review the basic algebra concepts and techniques needed to understand and apply the mathematical principles of the physical principles and to apply those principles by deriving and developing meaningful solutions to problems. A math assessment test covering Algebra I and II concepts will be given during the first week of school.

Summer Reading: During the summer break students will read one book that relates to the science and nature of physics. Students may choose from one of the books listed on the summer reading list for science. A test covering the material from the book will be given during the first two weeks of school in the following academic year.