

2015-2016 AP Physics I– A. Solender

asolender@wcpss.net

Course Overview:

The AP Physics 1 course is an introductory level physics course, requiring no previous instruction in physics. Students should have completed math III, or it's equivalent, or be currently in math III. Lab work is integral to the understanding of the concepts in this course. The AP Physics 1 Course has been designed by the College Board as a course equivalent to the algebra-based college-level physics class. At the end of the course, students will take the AP Physics 1 Exam, which will test their knowledge of both the concepts taught in the classroom and their use of the correct formulas.

Structure of the Test:

The AP Physics I exam is 3 hours long and consists of:

Section I- 50 multiple choice questions (90 minutes)

Section II- Five free response questions (90 minutes)

Outline for the Course:

The course covers the following topics:

- Kinematics
- Dynamics: Newton's laws
- Circular motion and universal law of gravitation
- Simple harmonic motion: simple pendulum and mass-spring systems
- Impulse, linear momentum, and conservation of linear momentum: collisions
- Work, energy, and conservation of energy
- Rotational motion: torque, rotational kinematics and energy, rotational dynamics, and conservation of angular momentum
- Electrostatics: electric charge and electric force
- DC circuits: resistors only
- Mechanical waves and sound

This course will emphasize student based learning and inquiry to promote growth in physics. This will be done in three major ways:

1. Independent Practice—Students will be daily assignments, generally from the text, to solve (usually two or three but may vary). These problems will be checked at the end of the week to allow students to do them at their own pace. Time will be given at the end of each class to allow students to work on problems or ask questions concerning the previous problems. In addition, most classes will begin with a review problem that students will do on their own. As the semester progresses, these questions will become more challenging and eventually be previous AP free-response questions. The end purpose is to provide students ample opportunity to work independently and build their problem-solving skills in physics.
2. Inquiry-Based Labs—Most labs will be done using the basic inquiry methodology. Students will be provided a problem or task, suggested materials, and a time limit. The burden will be on the students to design a procedure that will meet the requirements (EX: Verify the conservation of

momentum) in a reproducible experiment. These lab reports are not easily completed the night before it is due. They will require multiple hours and should go through a revision process.

3. Recitation—Several class periods will be devoted to problem solving sessions. During these classes, small groups (two to four students) will be given a different challenging problem to solve. After a certain amount of time, each group will then present their problem to the class. This will allow exposure to multiple problems and allow students to teach each other, requiring a much deeper knowledge of the problem at hand.

Grading Policies:

Major Grades (50%) – There will be tests/exams for each unit and some projects

Homework (10%) - In addition to homework, students will take a weekly homework quiz that is designed to help prepare them for the AP exam

Classwork Grades (40%) – This category is for lab reports, problem sets, and class activities

Lab Work:

The centerpiece of physics is lab work; this course is designed to reflect that. The main focus of the labs will be developing inquiry skills and proper recording of that scientific method. As stated above almost all of these labs will be done with current inquiry-based lab practices. Students will be presented a problem or a purpose statement and then will create the necessary procedure for the experiment. Students will be expected to come in during tutorials outside of class time to complete their assignments if they were unable to finish the lab in the time given.

Student and Class Expectations:

- Students are expected to go through the revision process when writing their lab reports. They should follow all standard convention and grammar rules and be written in a scientific format.
- Students are expected to complete all problem sets fully and show their work in a neat and legible manner.
- Students are expected to work with groups to complete lab activities. Lab reports are individual, but lab procedures will be completed in groups.
- Students are expected to seek additional help during tutorials from the teacher, access the class website for supplemental material, and work with classmates to study for exams.
- Students are expected to turn assignments in on time and completed to the best of their ability. Most assignments will be turned in online to mimic the college atmosphere.
- Students are expected to attend tutorials if they are absent, missing work, or do not have a passing grade in the course.