

AP PHYSICS 1 SYLLABUS

*** ADAPTED FOR DISTANCE LEARNING 2019-2020***

How To Access Information, Assignments, and Assessments

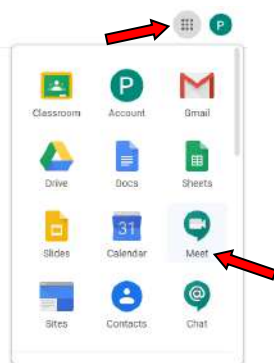
- All communication will be through Google Classroom, AP Classroom, and Remind.
 - Go to classroom.google.com and sign in using your school account.
 - Go to <https://www.chino.k12.ca.us/Page/3545> for instruction on signing up for Remind.

How To Contact Me

- Contact me through email:
 - patrick_woods@chino.k12.ca.us
- Contact me through Remind:
 - You will be able to send me a text message through the Remind App.

Virtual Office Hours using Google Meet:

- If you need live help, I will be hosting “Virtual Office Hours” on Tuesdays and Thursdays from 10 am – 12 noon. You can join any time during those hours, and you do not have to stay the entire time.
- Google Meet is a video-conferencing app like Skype. It is very easy to use. Once you are logged in to your school Google account, you should be able to find the nine dots (the Google Apps). Click that, and select the Meet app. (It might not be in the exact same spot for you...look around.)



- Select “Join or start a meeting”.
- Our meeting code will be “woods office hours”
- Virtual Office Hours Conduct:
 - Be Respectful, Be Responsible, and Be Involved
 - Others can see and hear you and your background - Be fully clothed (school dress code appropriate).
 - When you first sign in, say “Hello” and then mute your microphone. This allows a current conversation to continue. (If you are the only student signed in, you do not have to keep your mic muted.)
 - You can signal that you want to speak by raising your hand (just like in class).
- If you cannot for some reason join Virtual Office Hours, then simply contact me through email or the Remind app (see above).

Grades:

- Assessments (taken through Google Classroom or AP Classroom)
 - Quizzes will be “formative assessments”, and will not count toward your grade.
 - Quiz Feedback – You will see which questions you missed, and the right answers.
 - Tests will be “summative assessments”, and will count toward your grade.
 - Test Feedback – You will see which questions you missed, but you will NOT be shown the correct answers.
 - Tests can be retaken one time, and students will keep the higher of the two scores.
- Assignments (completed through Google Classroom)
 - Assignments can be submitted late for full credit. (Of course, it is better to do them on time.)

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TEXTBOOK

- Walker, James S. **Physics, AP Edition, 4th Edition**. San Francisco, CA: Pearson, 2010.

REQUIRED MATERIALS

- Two “Composition” style notebooks, quad ruled (graph paper), one for each semester
- Pencil or pen (blue or black only)
- Calculator (“scientific” type is fine, “graphing” is OK too; you want to work easily with exponents/roots and sin-cos-tan in both degrees and radians)
- Standard notebook paper

RECOMMENDED MATERIALS

- Clear tape (e.g. Scotch brand)
- Highlighters, colored pens, etc.

INSTRUCTIONAL STRATEGIES

The AP Physics 1 course is conducted using **inquiry-based instructional strategies** that focus on experimentation to develop students’ conceptual understanding of physics principles. Throughout the course, the students construct and use multiple representations of physical processes, solve multi-step problems, design investigations, and reflect on knowledge construction through self-assessment rubrics.

This course will include lecture and laboratory exercises. Laboratory activities will be comparable to the lab that is being done in college-level Physics I. The student will learn how to prepare and write laboratory reports. This course aims to prepare students to be able to explain and analyze real life situations that deal with Physics and also be able to solve problems in the field of science. During lecture, students will be involved in problem solving using formulas and will be expected to understand how formulas are related to each other. In addition, students will use calculators, computers, and online resources for interactive simulations, collaborative activities and formative assessments.

The AP Physics 1 course devotes over **25% of the time** to laboratory investigations. The students use **guided inquiry (GI)** or **open inquiry (OI)** in the design of their laboratory investigations. Some labs focus on investigating a physical phenomenon without having expectations of its outcomes. In other experiments, the student has an expectation of its outcome based on concepts constructed from prior experiences. In application experiments, the students use acquired physics principles to address practical problems.

All investigations are recorded in a laboratory notebook, and a typed hard copy report will be submitted, along with a submission to turnitin.com. Students are expected to record their observations, data, and data analyses. Data analyses include identification of the sources and effects of experimental uncertainty, calculations, results and conclusions, and suggestions for further refinement of the experiment as appropriate.

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THE “FLIPPED CLASSROOM”

I use what’s called a “flipped classroom”, where students watch assigned videos located on YouTube. The videos take the place of classroom lectures, and so students are expected to watch every video as they are assigned, and to take thorough notes from the videos. The other major change that happens is that what used to be the traditional homework is now usually done in class. There are many benefits to doing this, such as:

- Not lecturing during class time allows much more time for lab activities, particularly inquiry-based labs.
- There’s more time in class to practice solving problems, and to get help if needed.
- Students can take notes at their own pace, and don’t feel rushed. They can “pause” and “rewind” the teacher!
- Students can watch the lectures as often as they need to.

OTHER THINGS TO KNOW ABOUT AP PHYSICS 1

1. Ignore your grade – focus on learning! If you focus on the content, do your work on time with the course pacing, and ask questions as often as needed, you will do well.
2. Conceptual knowledge is way more important than the math. We will cover concept after concept and to truly do well in the class, you need to be ready to apply that knowledge in a different way as the question being asked will always be different than you expect. This means you need to be involved in the course and study regularly. If you do so, you can build upon your knowledge and gain a deeper understanding of the concepts.
3. The textbook is your friend. You NEED to read it. To say you don’t understand it or it does not make sense means you need to read it again (and again and again). Remember to read and understand the words in bold, the diagrams and their captions and review the practice problems done for you as well as the chapter summary. When you are in college (which you sort of are now thanks to AP), reading and taking notes are essential practices.
4. You have access to many great resources through technology, primarily on the Web. You will find hundreds of web sites and videos teaching you everything and it will be worth it to find good sites and bookmark them.
5. If you are spending an exceptionally large amount of time on one problem, skip it. You will realize that the understanding often comes to you later (after a short break, after working on another concept, or after more practice).
6. You need to be a reliable, contributing lab partner. Rely on each other so that you can help each other when the time comes and use your time wisely (i.e. socializing during class means you will be missing the best opportunity to get the difficult work done).
7. Do not cram. If the course was primarily a memorization-based content, then you could most likely get away with this but unfortunately AP Physics is completely application-based. Therefore, after cramming for eight hours on a certain scientific law and sample problems and you are certain you will do well, the test will have questions asked in a way you have never seen before and now you do not know what to do. Refer back to #1 and #2 above, and learn that you have to understand the concepts well enough that you can apply it when you are asked any type of questions by myself or AP College Board.

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COURSE SYNOPSIS

UNIT 1. KINEMATICS (Ch. 1,2,3,4)

- Kinematics in one-dimension: constant velocity and uniform accelerated motion
- Vectors: vector components and resultant
- Kinematics in two-dimensions: projectile motion

UNIT 2. DYNAMICS (Ch. 5,6)

- Forces, types and representation (FBD)
- Newton's First Law
- Newton's Third Law
- Newton's Second Law
- Applications of Newton's 2nd Law
- Friction
- Interacting objects: ropes and pulleys

UNIT 3. ENERGY (Ch. 7,8)

- Work
- Power
- Kinetic energy
- Potential energy: gravitational and elastic
- Conservation of energy

UNIT 4. MOMENTUM (Ch. 9)

- Impulse
- Momentum
- Conservation of momentum
- Elastic and inelastic collisions

UNIT 5. CIRCULAR MOTION AND GRAVITATION (Ch. 12)

- Uniform circular motion (from Ch. 6)
- Dynamics of uniform circular motion
- Universal Law of Gravitation

UNIT 6. ROTATIONAL MOTION (Ch. 10,11)

- Torque
- Center of mass
- Rotational kinematics
- Rotational dynamics and rotational inertia
- Rotational energy
- Angular momentum
- Conservation of angular momentum

UNIT 7. SIMPLE HARMONIC MOTION (Ch. 13)

- Linear restoring forces and simple harmonic motion
- Simple harmonic motion graphs
- Simple pendulum
- Mass-spring systems

UNIT 8. MECHANICAL WAVES (Ch. 14)

- Traveling waves
- Wave characteristics
- Sound
- Superposition
- Standing waves on a string
- Standing sound waves

UNIT 9. ELECTROSTATICS (Ch. 19)

- Electric charge and conservation of charge
- Electric force: Coulomb's Law

UNIT 10. DC CIRCUITS (Ch. 21)

- Electric resistance
- Ohm's Law
- DC circuits
- Series and parallel connections
- Kirchhoff's Laws

Note: The above list may not represent the exact order of topics – the sequence may be changed as needed.

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INTEGRITY

Integrity (synonymous with honesty) is of the utmost importance. It is the foundation of all intellectual pursuits. What is graded must represent the work done by the student and indicate the level of that student's achievement. Cheating and plagiarism undermine these goals. Cheating is a voluntary act for which there may be reasons, but for which there is no acceptable excuse. Cheating includes, but is not limited to:

- Receiving or knowingly supplying unauthorized information
- Changing an answer after work has been graded and representing it as improperly graded
- Using unauthorized materials or sources
- Plagiarism – copying someone else's work or letting them copy off you. This includes homework, labs, quizzes, exams, etc.

The ultimate decision as to whether something has been copied lies with the instructor. If you are caught cheating, you, along with anyone else involved, will receive a "zero" on the assignment/task, and may be subject to further discipline under the Chino Valley Unified School District Academic Honesty policies.

GRADING CATEGORIES

Tests/Quizzes	40%
Assignments	20%
Lab Class Activities/Projects	10%
Lab Homework	30%

GRADING SCALE

A...90-100%
B...80-89%
C...70-79%
D...60-69%
F...0-59%

EXTRA CREDIT

Don't expect any – this is a college-level course.

ABSENT WORK vs LATE WORK

Absences: If you miss class for any reason, it is YOUR RESPONSIBILITY to see Mr. Woods outside of class time to get the work you missed. You should get this material within 1 or 2 days of returning to class. You will be given a reasonable amount of time to complete and turn in any assignments you missed, but typically this will be less than one week. The assigned work is vital to your understanding and long-term retention of the material, so you should recognize its value and make sure you complete all assignments in a timely manner.