AP Physics 1 Course Outline

Text: Physics, Cutnell and Johnson 9th Edition Website: mcpheesics.weebly.com

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Overview:

Physics is the most basic of all sciences. In simplest terms physics is the study of why everything/anything happens. More specifically physics is the branch of science that studies the properties of matter and energy.

Physics attempts to explain the world around us using the beautiful language of mathematics. Why is the sky blue? What is sound? How fast and far do bullets travel and why? What is at the very core of matter?

Physics also applies that knowledge in the form of technology and engineering to bring us cars, telephones, computers and nano-robots that can be injected into the blood and deliver poison to cancer cells!

This course is the equivalent of the first semester of a typical first year university physics course. What that means for you is that we will be covering some very challenging material. If you are looking for an easy A, look elsewhere.

Expectations:

* This is a challenging course and challenges are fun. It will require you to THINK, REFLECT and WORK. I can promise that this will be among the toughest (and so most fun) course you have taken in high school so far.
* It is expected that students will take responsibility for their learning. This means students will attend all classes and complete all assignments, homework, quizzes and tests. A missed homework, assignment, quiz or test will count as ZERO.
* It is expected that students arrive on time with all materials.
* You are expected to behave respectfully in class. This means

DO NOT: talk during lectures

work on homework during lectures

use cell phones, mp3 players, electronic games

sleep

Extra Help:

You are expected to come in for extra help in this course. I am in my room after school most days. Please drop by, otherwise I will be sad and lonely. I can make myself available in mornings, but only by appointment.

Learning requires two participants: A teacher (Mr. McPhee) and a learner (You). If you fall behind please come to see me for extra help. Do not expect to just find me before school (It’s too darn early) or at lunch (I enjoy food, I might be addicted to it. I feel really awful if I don’t get any for an extended period. Should I be worried? ).

Also please (please, please, pretty please) ask questions in class. It makes things much better for both you and me. If you don’t ask I will assume you understand, which, if true, is fantastic. However, if untrue, you may fall behind to wallow in misery.

Homework:

Homework is most commonly in the form of a reading assignment or a worksheet. I will not check or mark your homework. Homework is for your benefit, not mine. If you have questions, or need to know if you have done a problem correctly, check the solutions and ask me to check your work.

Mark Distribution

|  |  |
| --- | --- |
| Labs, Projects | Tests, Quizzes |
| 15% | 85% |

Topics:

1. Kinematics

2. Dynamics including uniform circular motion, gravitation and electrostatics

3. Impulse and momentum

4. Work and energy

5. Rotation: Torque, angular acceleration, rotational kinematics and angular momentum.

(Introduction to radian measure of angles)

6. Waves, sound (and optics)

7. Simple harmonic motion

8. Introduction to DC circuits

9. Introduction to special relativity

What’s the BIG IDEA?

The AP Physics 1 and 2 curricula are designed around 7 “Big Ideas”. All of the above topics need to be considered with these big ideas in mind. In fact often the topics above will be mixed together in order to help illustrate that the ideas of physics are all connected.

BIG IDEA: Objects and systems have observable, measurable properties such as mass and charge. Systems may have internal structure.

BIG IDEA: Interactions between systems and objects may result in changes to the properties of the systems.

BIG IDEA: Changes that occur as a result of interactions are constrained by (and can therefore be understood by) conservation laws.

BIG IDEA: Interactions between objects and systems (and within systems) can be described with forces.

BIG IDEA: Forces can be described using fields existing in space.

BIG IDEA: Waves can transfer momentum and energy without a transfer of mass.

BIG IDEA: Probability must be used to understand the behaviour of complex systems and understand behaviour at the quantum mechanical level.

Please note that the order of topics may vary. We need to cover both the regular BC Physics 11 curriculum and the AP Physics 1 curriculum.