

## *Advanced Placement Physics 1 Syllabus*

Room and Period	A-5, period 5
Instructor	Ms Sarah Walsh
Course Description	Advanced Physics is a College Preparatory course that uses advanced algebra, trigonometry and logical skills as the primary tools for problem solving. The class focuses on learning concepts and later applies mathematics to solve problems.
Contact	<a href="mailto:swalsh@berean-eagles.org">swalsh@berean-eagles.org</a> <a href="mailto:chemlady2000@yahoo.com">chemlady2000@yahoo.com</a> (for evening physics help) Office phone: ext. 213
Student Prerequisites	All students must have had algebra II, preferably with trigonometry.
Textbooks and Materials	College Physics, Serway/Vuille, 8 <sup>th</sup> ed. Binder, scientific calculator, graph paper

Ancillary Material	Review material for the AP exam preparation will be provided.
Laboratory	The lab component is an extensive part of the Physics course. Most labs are open-ended with an emphasis on development of skills of scientific investigation; that is, they are inquiry-based. Students are required to record raw data for all laboratories, formal and informal.
<b>Critical Thinking Skill Development</b>	<b>The development of critical thinking skills is an integral part of Physics and is interwoven throughout all components of the course. The skills practiced and developed in this area are a key ingredient to success on the AP College Board Exam.</b>
Grading Scheme	<u>Quarter Grades:</u> Tests: 40% Quizzes: 15% Classwork and Participation 25% Homework: 20%  <u>Semester Grades:</u> 1 <sup>st</sup> Quarter: 40% 2 <sup>nd</sup> Quarter: 40% Final Exam: 20%
Tests and Quizzes	There will be two to three tests per quarter, one for each unit. Tests are based mainly on mathematical problem solving.  Tests are an indication that the student understands the material, thus the high percentage of a student's grade relies on tests. They are graded with no partial credit, however, the day after each test the students will be given the solutions to the test and be given a chance to earn back points. If the student can show me that they have just made a silly math error or other minor mistake, points will be earned back. Quizzes are based on concepts more than mathematical problem

	solving. Online quizzes will be given using iPads and there may be some hard copy quizzes.
Classwork and Participation	Classwork includes lab reports, in class activities and participation. It is important that students are focused and on task in class as AP Physics is a difficult subject and there is no time to waste. Students will also be graded on how well they participate in daily review activities.
Homework	Homework is completed on webassign, a web-based homework program. It uses the same questions in their textbook but allows for you to enter their answers and get immediate feedback. You are also given a set number of opportunities to enter their answer again until they get the correct answer. Webassign will be available to use on the iPads.
Late work policy	Homework on websassign will be due at the time and date indicated online and on Renweb. Solutions to the homework will be posted the next day after they are due, therefore late homework of this fashion will not be accepted unless there are extenuating circumstances.
Physics Apps	Physics class will use Vernier apps for labs on their iPad. These should already be downloaded by the administration.

### ***List of Units of Study***

*Unit: 1-D Kinematics (2 weeks)*

*Chapter 2: average speed and velocity, instantaneous velocity, acceleration, graphs of motion, kinematic equations, free fall*

*Unit: Vectors (2 weeks)*

*Chapter 3: introduction and components, graphical vector addition, addition of vectors by components*

*Unit: 2-D Kinematics (2 weeks)*

*Chapter 3: general method, projectiles with zero launch angle, projectiles and general launch angle, symmetry in projectiles, range over level ground*

*Unit: Newton's Laws (2 weeks)*

*Chapter 4: Newton's 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> Law, weight and apparent weight, normal forces*

*Unit: Applications of Newton's Laws (2 weeks)*

*Chapter 4: friction, strings and tension, pulleys on flat ramps, pulleys on angled ramps, centripetal forces*

*Unit: Work and Energy (2 weeks)*

*Chapter 5: work and energy, variable forces, power, conservative and non-forces, potential energy, conservation of mechanical energy, dissipative forces and conservation of energy*

*Unit: Linear Momentum (2 weeks)*

*Chapter 6: linear momentum as a vector, impulse, conservation of linear momentum, collisions, momentum in 2-D*

*Unit: Rotation (2 weeks)*

*Chapters 7 & 8: torque and rotational equilibrium, Law of gravity, Kepler's Laws and orbit, gravitation potential energy and escape velocity, angular momentum*

*Unit: Oscillation (2 weeks)*

*Chapter 13: simple harmonic motion, Hooke's Law, Conservation of energy in oscillators, period of a pendulum*

*Unit: Electrostatics (2 ½ weeks)*

*Chapter 15 & 16: charge and polarization, Coulomb's Law, electric field, motion of charged particles in an electric force*

*Unit: Circuits (2 ½ weeks)*

*Chapter 17 & 18: current, Ohm's Law, Resistivity, Equivalent resistance, Kirchoff's rules, Capacitors in circuits*

*Unit: Waves and Sound (2 weeks)*

*Chapters 24 & 25: types of waves, superposition and interference of waves, resonance, Doppler Effect, standing waves*

