

## Advanced Placement Physics Syllabus

**Course Description:** Advanced Placement Physics B is an introductory, college-level course. Topics include classical as well as modern physics. Emphasis is placed on conceptual knowledge as well as problem solving skills utilizing algebra and trigonometry in conjunction with laboratory exercises to develop critical thinking skills that are necessary for success in college or a variety of careers. The student will take the Advanced Placement Exam in Physics in May and success on this exam can allow the student to earn college or university credit.

**Text:** Cutnell & Johnson (2004) *Physics, 6<sup>th</sup> ed.* Hoboken: John Wiley & Sons

**Required Materials:** 3-Ring Binder  
 Scientific Calculator  
 Loose-leaf Paper  
 No. 2 Pencils  
 Composition Notebook (Science Project)  
 3-Ring Plastic Lab Folder

**Course Outline:** The course is structured after guidelines from the College Board AP Physics B model which sets the standards for exam content percentages. These are:

Topics	Percentage of Exam	Textbook Chapters	Labs (per block) (Student Conducted)
<b>Newtonian Mechanics (11 weeks)</b> <ul style="list-style-type: none"> <li>• Kinematics</li> <li>• Newton's Laws of Motion</li> <li>• Work, Energy, Power</li> <li>• Systems of particles, linear momentum</li> <li>• Circular motion and rotation</li> <li>• Oscillations and Gravitation</li> </ul>	35% 7% 9% 5% 4% 4% 6%	<b>Chap. 1-7; 9;10</b> <ul style="list-style-type: none"> <li>• Chap. 1-3</li> <li>• Chap. 4-5</li> <li>• Chap. 6</li> <li>• Chap. 7</li> <li>• Chap. 5,9</li> <li>• Chap. 10,4,5</li> </ul>	<ul style="list-style-type: none"> <li>• Precision/Error Analysis Lab</li> <li>• Motion</li> <li>• Experimental Determination of g</li> <li>• Projectile Motion</li> <li>• Equilibrium of Forces</li> <li>• Coefficient of Friction Lab</li> <li>• SHM/ Pendulum Lab</li> </ul>
<b>Fluid Mechanics and Thermal Physics (3 weeks)</b> <ul style="list-style-type: none"> <li>• Fluid Mechanics</li> <li>• Temperature and Heat</li> <li>• Kinetic theory and thermodynamics</li> </ul>	15% 6% 2% 7%	<b>Chap. 11-15</b> <ul style="list-style-type: none"> <li>• Chap. 11</li> <li>• Chap. 12-13</li> <li>• Chap. 14-15</li> </ul>	<ul style="list-style-type: none"> <li>• Pascal's Principle Lab</li> </ul>
<b>Electricity and Magnetism (9 weeks)</b> <ul style="list-style-type: none"> <li>• Electrostatics</li> <li>• Conductors, capacitors, dielectrics</li> <li>• Electric Circuits</li> <li>• Magnetostatics</li> <li>• Electromagnetism</li> </ul>	25% 5% 4% 7% 4% 5%	<b>Chap. 18-22</b> <ul style="list-style-type: none"> <li>• Chap. 18-19</li> <li>• Chap. 19</li> <li>• Chap. 20</li> <li>• Chap. 21</li> <li>• Chap. 22</li> </ul>	<ul style="list-style-type: none"> <li>• Ohm's Law</li> <li>• Series/Parallel/RC Circuits (Kirchoff's Laws)</li> <li>• Faraday's Law</li> </ul>
<b>Waves and Optics (3 weeks)</b> <ul style="list-style-type: none"> <li>• Wave motion</li> <li>• Physical Optics</li> <li>• Geometric Optics</li> </ul>	15% 5% 5% 5%	<b>Chap. 16-17; 24-27</b> <ul style="list-style-type: none"> <li>• Chap. 16-17</li> <li>• Chap. 27</li> <li>• Chap. 24-26</li> </ul>	<ul style="list-style-type: none"> <li>• Snell's Law Lab</li> <li>• Lenses and Mirrors</li> <li>• Interference and Diffraction</li> </ul>
<b>Atomic and Nuclear Physics (2 weeks)</b> <ul style="list-style-type: none"> <li>• Atomic physics and quantum effects</li> <li>• Nuclear physics</li> </ul>	10% 7% 3%	<b>Chap. 29-32</b> <ul style="list-style-type: none"> <li>• Chap. 29-30</li> <li>• Chap. 31-32</li> </ul>	<ul style="list-style-type: none"> <li>• Quantum Potpourri (virtual)</li> </ul>

**Expectations:**

**Attendance:** In short, you must attend and actively participate in order to be successful in this class. Students are expected to follow District and School guidelines regarding tardies and absences. Excessive tardies and/or absences can lead to dire consequences due to missed instruction or graded assignments.

**Assignments:**

- This is a college-level class and the student will come to class prepared. This includes such things as bringing necessary materials, pre-reading, completing homework, having well-thought questions for the instructor. In this vein, the student should aim beyond the assigned work provided in class.
- CLASS READINGS ARE REQUIRED. Success at this level relies on instruction during class time as well as individual reading on the part of the student.
- It is strongly suggested that the student register with the College Board (<http://www.collegeboard.com>) for AP Physics B. This will provide the student with essential information regarding the AP test, review materials, and other information involving physics.

**Laboratory Exercises:** These are listed in the Course Outline but may be adjusted as the instructor sees fit. The labs are designed to correlate with and expand upon the lecture and reading material. Lab exercises may be hands-on, demonstration, or virtual. The instructor will set due dates and format guides for the student.

**Evaluation:** Per policy, the Newport News Public Schools grading scale is used and each quarterly grade is based on the following percentages:

Tests	40%	Homework/Classwork	20%
Quizzes	10%	Projects/Science Project	10%
Labs	20%		

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**Parents and Students: Please acknowledge by your signatures below that you have reviewed, understood, and accepted the criteria outlined in the syllabus. Return this form ASAP to the instructor. This will serve as the student’s first assignment grade in this class.**

We, the undersigned, have read and understand the information herein. Furthermore, the student has the responsibility to have this syllabus signed and kept in his or her binder.

Student: \_\_\_\_\_

Parent: \_\_\_\_\_