

**Course Title:** AP Physics B

**Board Approval Date:** June, 2010

**Credit / Hours:** 1 credit

**Course Description:**

The AP Physics B course is a college level non-calculus based survey physics course that includes topics in mechanics, electricity and magnetism, fluid mechanics, thermal physics, waves and optics, and atomic and nuclear physics.

The AP Physics B exam is a 180 minute exam typically made up of 70 multiple choice questions and several free response problems. There are 6 to 8 free response problems worth 10 to 15 points each, depending on length.

**Learning Activities / Modes of Assessment:**

**CLASSES:**

1. Each class will begin with a brief question and/or problem from previous discussions or activities.
2. Introduction and discussion of topics and concepts. Problem solving, review, and real-life applications.
3. Applicable laboratory activities and/or projects.

**PROBLEM ASSIGNMENTS:**

1. Assigned questions and problems will come from the textbook, review books, released AP Exams, and problem sets that have been teacher constructed.
2. A problem solving process will be emphasized to help find solution to all problems that are encountered. Solutions to the problems will be posted after the due date.

**LABS:**

1. Two types of labs will be conducted:
  - a. Inquiry labs (Single concept)
  - b. Formal labs. Includes open-ended labs and special projects.
2. All formal labs and selected inquiry labs must be completed and submitted in a lab notebook that incorporates a designated format. These labs are either college level laboratory activities or labs adapted from college level laboratory activities.
3. Data for many of the labs is collected by using Vernier sensors, including: motion detectors, force probes, temperature probes, light sensors, photo gates, etc. Logger Pro® 3 software is used in conjunction with the Vernier sensors to analyze and interpret data collected.

**EVALUATIONS:**

1. A quiz or test will be given at the end of each unit.
2. Each quiz or test will include questions and problems from released AP exams as well as other questions and problems from class work and applications.
3. Labs and reports.
4. Class participation, homework, projects and activities.

### **Instructional Resources:**

Primary: *PHYSICS*, Second Edition; Walker, James S.; Pearson Education, Inc.; 2004.

Supplemental: *Holt PHYSICS*; Serway, Raymond A.; & Faughn, Jerry S.; Holt, Rinehart and Winston; 2000.

Laboratory Manuals: *PHYSICS 211, Classical and Modern Physics, LABORATORY MANUAL*; Fall 2005; Bucknell University Physics Department; 2005.

## AP Physics B Course Pacing Guide

Course: AP Physics B

| Course Units and Topics  | Length of Instruction |
|--|-----------------------|
| 1. Fundamentals of Values and Measurements                                     | 1 period              |
| 2. Vectors   | 2 periods             |
| 3. 1-Dimensional Linear Kinematics (Motion)                                    | 4 periods             |
| 4. Falling Objects (Vertical velocity and acceleration)                        | 3 periods             |
| 5. Projectile Motion (Two Dimensional Motion)                                  | 2 periods             |
| 6. Forces, Force Vectors, and Equilibrium                                      | 4 periods             |
| 7. Newton's Laws of Motion   | 6 periods             |
| 8. Everyday Forces   | 2 periods             |
| 9. Newton's Universal Law of Gravity & Einstein's General Theory of Relativity | 1 period              |
| 10. Work, Power, and Machines  | 4 periods             |
| 11. Energy   | 6 periods             |
| 12. Momentum and Collisions  | 4 periods             |
| 13. Rotational equilibrium and dynamics  | 3 periods             |
| 14. Simple Harmonic Motion   | 3 periods             |

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| 15. Properties of Waves and Wave Interactions                        | 5 periods  |
| 16. Sound  | 6 periods  |
| 17. Light, Reflection, Refraction, Interference and Diffraction -5%  | 7 periods  |
| 18. Heat and Thermodynamics  | 3 periods  |
| 19. Fluid Mechanics  | 3 periods  |
| 20. Electric Forces, Current and Resistance, Circuits, and Magnetism | 16 periods |
| 22. Nuclear Physics  | 2 periods  |
| 21. Subatomic Physics  | 2 periods  |