PSI Physics

Instructors

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Course Description

This is the first course in a two-year physics sequence. It uses an algebra-based approach to explore several AP physics B topics: Mechanics; Electricity & Magnetism; and Simple Harmonic Motion, Waves, Light & the Bohr Model of Hydrogen. The second course in the sequence, AP Physics B, adds a trigonometry-based perspective to those first-year topics while expanding the number of topics. The result is that students are prepared to take the AP Physics B examination as early as the end of their sophomore year.

In addition to providing a specific foundation for the AP Physics B course, this course also provides students a strong general foundation in both science and mathematics. Ninth grade physics provides the foundation for the chemistry that is taught in tenth grade, while the combination of physics and chemistry supports eleventh grade biology. This represents a very effective sequence of science instruction.

As importantly, the math and physics courses are synchronized in order that they complement each other. The use of algebra in this course reinforces what is learned in Algebra. The Math Analysis courses are similarly reinforced by the AP Physics B course.

Course Outline

Mechanics

- One-Dimensional Kinematics
- One-Dimensional Dynamics
- Uniform Circular Motion
- Universal Gravitation
- Work and Energy
- One-Dimensional Linear Momentum

Electricity & Magnetism

- Electrostatics
- Electric Fields and Potential
- Electric Current
- DC Circuit

Magnetic Fields
Electromagnetic Induction

Simple Harmonic Motion, Waves, Light and Bohr Model of Hydrogen

Spring – Mass Systems
The Pendulum
Wave Properties
Electromagnetic Waves
Light as a Wave
Two Slit Experiment
Photoelectric Effect
Light as a Particle
Matter Waves
The Bohr Atom

Requirements and Expectations

Students are expected to arrive in class promptly with their binder and pencils. During class, students are expected to participate and show proper respect to their teacher, classmates and classroom. Of course, students will be expected to follow all rules and procedures that they are given by the teacher and the Perth Amboy Code of Conduct.

It is suggested that students use a three ring binder, as there will be numerous documents which will need to be kept in an organized manner. These include handouts, lab reports, homework assignments, and graded tests and quizzes. This will be important throughout the year, but will be especially important in preparing for the midterm and final exams.

Students will be given homework and reading assignments. These assignments need to be completed by the designated time in order that the student is prepared for class.

Course Work and Assessment

Students will be assessed based on their results on quizzes, quests and tests, as well as their lab work and lab reports.

Tests will occur at the end of each major topic and are based on about 100 points. Quests are based on 40-60 points and may be given in the middle of a topic or in lieu of a test. Quizzes will have a point value of up to 25 points and may be given at any time, with or without prior notice. Students will always be given advanced notice of tests and quests.

Retakes of quizzes, tests, and quests will be granted once the student provides sufficient evidence that he/she is prepared. The highest grade earned replaces the lower grade. Retakes are not given during class time. Arrange an appropriate time for retakes with your teacher.

Students will be conducting a full-scale physics lab approximately every other week for total of about four labs per quarter. The write-up form each lab will be due the following week and will be graded based on a score of 10 points. As a result, the laboratory work during a quarter will have a weight of approximately 10% of the final grade.

The grade for the course will be determined by computing the mathematical average of the points earned by the student divided by the number of possible points. Participation and other factors will only affect the student's grade if he or she is on the border between two possible outcomes.

Midterms and Finals

In addition to their four quarterly grades, students will also receive a separate grade on their transcript for their midterm and final exams. Each quarterly grade carries a weight of 20% of the full year grade while these two exams each have a weight of 10%. Together they have the same impact as a single quarter's result.

The midterm exam will be on the work covered through the first two quarters. The final exam will be on the work for the entire year. It tests the cumulative knowledge retained by the student at the end of the course.

Teacher Availability

Teachers are available to assist students at many times during the school day. However, the exact times vary from day to day. In any case, the student should work out the best time by asking their teacher in advance to make sure that he/she is available and has no conflicting meetings.

Teachers are available for tutoring in the Learning Center(s). The Learning Center(s) are open from 3:15 – 7:15 pm each day.

Teachers are also available to both students and parents via school email address, which are indicated above, as well as on individual teacher websites.

Recommended Links

http://njctl.org/courses/science/algebra-based-physics/
http://www.youtube.com/user/thenjctl
http://www.paps.net/pahigh