Radnor High School
Course Syllabus:
Advanced Physics 0342

Credits: 1.0 Credit,
Weighted: Unweighted
Length: 1 Year
Format: Meets Daily

Grades: 11 & 12
Prerequisite(s): Advanced Chemistry or higher
Co-requisite(s): Trigonometry or higher

Overall Description of Course

Advanced Physics is an algebra-based college preparatory course that provides a challenging examination of mechanics (motion, forces, energy, momentum, and waves), light and optics (lenses and mirrors), and electricity and magnetism (current, voltage, resistance, and circuits). Detailed reading of the textbook and comprehension of mathematical concepts are expected of these students. Writing of thorough lab reports and a moderate degree of independent study is required. In advanced physics, quantities are measured and mathematical relationships and laws are discovered to better understand the world. All levels of physics are lab-based courses emphasizing the discovery of these laws and relationships.

Student Objectives:

Advanced Physics is an algebra-based college preparatory course which approaches physics by studying its mathematical relationships. Students will be expected to develop problem solving skills that allow them to better understand the mathematical relationships that exist between physical quantities. In addition students will be expected to setup and perform experiments to study these relationships more in depth. The labs and activities will help in the understanding of concepts, while enhancing basic science skills and requiring students to organize and interpret data.

Materials & Texts

MATERIALS

- Scientific calculator (or a graphing calculator)
- Ruler & protractor
- Three-ring notebook
- Lined notebook paper

TEXTBOOK

- Giancoli, Physics, 5th edition. Prentice Hall

Activities, Assignments, & Assessments

Common Core Standards
CC.2.1.HS.F.1 - Apply and extend the properties of exponents to solve problems with rational exponents.
CC.2.1.HS.F.2 - Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F.3 - Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs, and data displays.
CC.2.1.HS.F.4 - Use units as a way to understand problems and to guide the solution of multi-step problems.
CC.2.1.HS.F.5 - Choose a level of accuracy appropriate to limitations on measurement when reporting

quantities.

CC.2.2.HS.D.1 - Interpret the structure of expressions to represent a quantity in terms of its context.

CC.2.2.HS.D.2 - Write expressions in equivalent forms to solve problems.

CC.2.2.HS.D.7 - Create and graph equations or inequalities to describe numbers or relationships.

CC.2.2.HS.D.8 - Apply inverse operations to solve equations or formulas for a given variable.

CC.2.2.HS.D.9 - Use reasoning to solve equations and justify the solution method.

CC.2.2.HS.D.10 - Represent, solve, and interpret equations/inequalities and systems of equations/inequalities algebraically and graphically.

CC.2.2.HS.C.2 - Graph and analyze functions and use their properties to make connections between the different representations.

CC.2.2.HS.C.3 - Write functions or sequences that model relationships between two quantities.

CC.2.2.HS.C.5 - Construct and compare linear, quadratic, and exponential models to solve problems.

CC.2.2.HS.C.6 - Interpret functions in terms of the situations they model.

CC.2.2.HS.C.8 - Choose trigonometric functions to model periodic phenomena and describe the properties of the graphs.

CC.2.3.HS.A.7 - Apply trigonometric ratios to solve problems involving right triangles.

CC.2.3.HS.A.12 - Explain volume formulas and use them to solve problems.

CC.2.3.HS.A.14 - Apply geometric concepts to model and solve real world problems.

CC.2.4.HS.B.2 - Summarize, represent, and interpret data on two categorical and quantitative variables.

CC.2.4.HS.B.5 - Make inferences and justify conclusions based on sample surveys, experiments, and observational studies.

CC.3.5.11-12.C.- Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

CC.3.5.11-12.D.- Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 10-11 texts and topics.

CC.3.5.11-12.G- Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia_ in order to address a question or solve a problem.

CC.3.5.11-12.H.- Evaluate the hypothesis, data, analysis, and conclusions in a science or technological text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.

CC.3.5.11-12.I- Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.

CC.3.6.11-12.A.- Write arguments focused on discipline-specific content.

CC.3.6.11-12.B.- Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

CC.3.6.11-12.C.- Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

CC.3.6.11-12.H.- Draw evidence from multiple informational texts to support analysis, reflection, and research.

CC.3.6.11-12.I.- Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.