Course Description

Physics is a yearlong course designed to develop your scientific reasoning skills and inspire in you a greater appreciation for God's handiwork displayed in the laws of nature. The course work will cover mechanics, waves, electricity, and light. You will explore these topics through interactive reading activities, animations, class discussions and online research, as well as in the laboratory. The course relies heavily on The Physics Classroom (www.physicsclassroom.com), an online resource created by a physics teacher and now supported by NSF. Your coursework will include reading and completing self-check assignments, problem solving, assignments based on simulations provided by PhET (phet.colorado.edu), lab work and data analysis using logger pro, class discussions, and exams. This course is designed to prepare you for success in a college level physics course. The math in the course includes algebra, geometry, and right triangle trigonometry.

This is a yearlong course consisting of 18 units. Upon successful completion students will receive 1 credit towards high school graduation.

Course Overview

Semester 1

- The Fundamentals
- Motion
- Free Fall
- Vectors and Projectiles
- Newton's Laws
- Application of Newton's Laws
- Work, Mechanical Energy, and Simple Machines
- Springs, Elastic Energy, and Simple Harmonic Motion
- Momentum

Semester 2

- Circular Motion and Universal Gravitation
- The Physics of Rotation
- Electric Charges and Their Interactions
- Electric Currents and Circuits
- General Properties of Wave Motion
- Sound Waves and Their Applications
- The Wave Properties of Light
- Reflection and Mirrors
- Refraction and Lenses

Required Course Materials

Please access the list of course materials from the OC Online book ordering system and order your materials as soon as possible. Oftentimes, course materials are on back order and you may experience a delay in receiving them, causing students to fall behind in their online coursework. When ordering used or rented materials, be careful that online access codes are also current.

Methods of Instruction

Studying physics will require that you engage with the material in as many ways as possible. This will include reading, observing demonstrations, discussing ideas with your classmates, performing labs, analyzing data, and completing lots of problem solving. How will you know if you understand the concepts? And how will you earn you grade?

- In each reading there are interactive practice questions for you to try before moving on. You will also regularly have a worksheet to complete as you complete the reading. The worksheet's answer key is available so that you can assess your understanding.
- You will frequently use an online quiz program to test yourself. You will take screen shots to demonstrate your success and earn credit for the quiz.
- Problem solving is the major activity in physics. You will complete many problem sets for credit throughout the course.
- Class discussions will be another significant component of your grade. These will provide you with an opportunity to ask questions and demonstrate your understanding of the material you have been studying.
- You will complete labs in most units.
- Writing assignments will occur on occasion in this course. They could include a research component and might also involve online simulations.
- Each unit has a unit exam. These exams include multiple choice, short answer, and problem solving.
- There are two semester exams that are proctored using Proctor U.
- Synchronous Sessions

Methods of Evaluation

Students will demonstrate mastery through the following formative and summative assessments:

- 40% Assignments
- 10% Participation (Discussion Posts, Synchronous Sessions)
- 10% Quizzes
- 25% Final Exam
- 15% Unit Tests