

NGSS Physics

Course Overview and Syllabus

Grade level: 11–12

Prerequisite Courses: Algebra

Credits: 1.0

Course Description

This full-year course focuses on traditional concepts in physics, and encourages exploration of new discoveries in this field of science. The course includes an overview of scientific principles and procedures, and leads students toward a clearer understanding of motion, energy, electricity, magnetism, and the laws that govern the physical universe. As students refine and expand their understanding of physics, they will apply their knowledge in experiments that require them to ask questions and create hypotheses. Throughout the course, students solve problems, reason abstractly, and learn to think critically.

Course Objectives

Throughout the course, you will meet the following goals:

- Explain the relationship between forces and motion.
- Recognize the interdependence of work and energy.
- Relate heat and temperature change on the macroscopic level to particle motion on the microscopic level.
- Demonstrate an understanding of waves, including sound and light.
- Investigate the electromagnetic spectrum.
- Analyze the connection between electricity and magnetism.
- Examine nuclear reactions and their applications.
- Explore recent advancements in physics such as the dual nature of light and nanotechnology.

Student Expectations

This course requires the same level of commitment from you as a traditional classroom course would. Throughout the course, you are expected to spend approximately 5–7 hours per week online on the following activities:

- Interactive lessons that include a mixture of instructional videos and tasks
- Labs that allow you to explore physics applications

- Assignments in which you apply and extend learning in each lesson
- Assessments, including quizzes, tests, and cumulative exams

Communication

Your teacher will communicate with you regularly through discussions, e-mail, chat, and system announcements. You will also communicate with classmates, either via online tools or face to face, as you collaborate on projects, ask and answer questions in your peer group, and develop your speaking and listening skills.

Grading Policy

You will be graded on the work you do online and the work you submit electronically to your teacher. The weighting for each category of graded activity is listed below.

| Grading Category | Weight |
|------------------|--------|
| Quiz | 20% |
| Test | 30% |
| Exam | 20% |
| Assignment | 10% |
| Lab | 10% |
| Additional | 0% |
| Project | 10% |

Scope and Sequence

When you log into Edgenuity, you can view the entire course map—an interactive scope and sequence of all topics you will study. The units of study are summarized below:

Unit 1: One-Dimensional Motion, Forces, and Momentum

Unit 2: Two-Dimensional Motion

Unit 3: Work and Energy

Unit 4: Thermodynamics

Unit 5: Harmonic Motion and Sound Waves

Unit 6: Electromagnetic Waves and Light

Unit 7: Electricity and Magnetism

Unit 8: Nuclear Physics

Unit 9: Modern Physics