

## Physics/Part A – High School

**COURSE DESCRIPTION:** The branch of science we call physics mainly focuses on matter and energy. It uses the four major concepts: mass, energy, force, and charge. The goal of physics is to describe the behavior of the world. This course stresses the importance of physics in day-to-day life and aims to help the student understand the theoretical concepts of physics through practical applications. Students learn and experience the behavior of motion in one- and two-dimensions, force, work, energy, momentum and collisions, gravitation, heat, thermodynamics, waves, electricity, circuits, magnetism, and atomic physics. This helps the student understand its functions and observe the relationship between one and another. Around forty percent of the course involves virtual laboratories. In addition, the course contains multiple practical activities in each unit, which require household objects, such as rulers, meter sticks, balls, strings, paper and pencil. The course concludes with a basic exploration of atomic physics and magnetism and the relationship between the two.

**COURSE OBJECTIVES:**

- Explain the laws governing motion and interpret the equations governing motion.
- Describe the effects of forces on the motion of objects.
- Recognize that energy and momentum are conserved.
- Analyze and explain the laws of thermodynamics.

**PREREQUISITES:** None

**COURSE LENGTH:** One Semester

**REQUIRED TEXT:** No required text for this course.

**MATERIALS LIST:** [Physics Materials List](#) (Click to download)

**COURSE OUTLINE:**

**Unit 1: Course Overview**

- Section 1 - Physics Introduction
- Section 2 - Getting Started
- Section 3 - Guidelines for the laboratory

**Unit 2: Physics and the Laws of Motion**

- Section 1 - Physics and Laws of Motion: Introduction
- Section 2 - Motion in One Dimension
- Section 3 - Two-dimensional Motion and Vectors
- Section 4 - Forces and the Laws of Motion
- Section 5 - Unit Exam

### **Unit 3: Energy and Motion**

- Section 1 - Energy and Motion: Introduction
- Section 2 - Work and Energy
- Section 3 - Momentum and Collisions
- Section 4 - Circular Motion and Gravitation
- Section 5 - Unit Exam

### **Unit 4: Heat and Thermodynamics**

- Section 1 - Heat and Thermodynamics: Introduction
- Section 2 - Heat
- Section 3 - Thermodynamics
- Section 4 - Unit Exam

### **Semester 1 Exam**