

## Physics B Course Description

Physics, a branch of science, 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 the day-to-day life. Students would 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 will help the student understand the functions and observe the relationship between one and another. Around forty percent of the course engages the student in virtual laboratory. In addition, the course contains multiple practical activities in each unit that will help the student understand each concept better. These activities require minimal objects such as rulers, meter sticks, balls, strings, paper and pencil that can usually be found in the home. On the whole, the course aims at helping the student understand the theoretical concepts of physics through practical applications. It concludes with a basic exploration of atomic physics. The concepts and themes found throughout the course are useful to you to understand the basic concepts of physics and their applications in day-to-day activities. Assignments are designed in a way to help you understand the application of the basic concepts of physics in every section. As you go through various units, you may be required to take periodic assessments that will prove your knowledge acquired through this course.

### Course Outline

#### Unit 1 - Waves:

- Waves: Introduction
- Oscillations - Simple Harmonic Motion
- Waves in Elastic Medium and Sound
- Light
- Unit Exam

#### Unit 2 - Electrostatics:

- Electrostatics: Introduction
- Electrostatics
- Electrical Energy
- Unit Exam

#### Unit 3 - Electric Current:

- Electric Current: Introduction
- Current and Resistance
- Circuits and Circuit Elements
- Unit Exam

#### Unit 4 - Magnetism:

- Magnetism: Introduction
- Magnetism
- Electromagnetic Induction
- Unit Exam

Unit 5 - Introduction to Modern Physics:

- Introduction
- Atomic Physics
- Atom Models
- Special Theory of Relativity
- Unit Exam

**Course Objectives**

**After completing each course, the student will be able to:**

1. Explain the laws governing motion and interpret the equations governing motion.
2. Describe the effects of forces on the motion of objects.
3. Recognize that energy and momentum are conserved.
4. Analyze and explain the laws of thermodynamics.
5. Identify characteristics of waves and describe behaviors of waves.
6. Demonstrate the relationship between electricity and magnetism.
7. Explain simple examples of quantum physics.
8. Describe how physics influences everyday life.
9. Explain field and laboratory investigations using the scientific method.
10. Adopt critical thinking and scientific problem-solving methods to make informed decisions.