

Physics I

Pre-Requisites: Algebra I & II recommended

Credits: 0.5 (per segment)

Estimated Completion Time: 2 segments / 32-36 weeks

Earliest Start Date: March 2014

Description

In each module of Physics I, students discover the contributions of scientific geniuses like Galileo, Newton, and Einstein. Through their work, students learn the concepts, theories, and laws that govern the interaction of matter, energy, and forces. From tiny atoms to galaxies with millions of stars, the universal laws of physics are explained through real-world examples. Using laboratory activities, videos, software, and websites, students follow in the footsteps of some of the world's greatest thinkers.

Major Topics and Concepts

Segment 1

Learning Styles

Plagiarism, Libel, Slander

Theory vs. law, science vs. pseudoscience

Measurement Techniques

Graphing Data using Graphical Analysis

Experimental Techniques

Lab Design

Average and Instantaneous Speed

Problem-Solving Methods

Vector and Scalar Quantities

Equation Manipulation

Average Velocity

Average Acceleration

Freefall

Mechanical Universe video - The Law of Falling Bodies

Newton's Laws

Mechanical Universe video - The Fundamental Forces

Newton's Law of Universal Gravitation

Coulomb's Law

Mass and Weight

Mechanical Universe video - The Apple and the Moon

Free-body Diagrams

Uniform Circular Motion

Angular Momentum

·Projectile Motion

Segment 2

Temperature and Heat

Conservation of Thermal Energy

Kinetic and Potential Energy

Work and Power

Conductors and Insulators

MUHSA Electrical Fields and Forces

Simple Circuits

Components

Charge Motion

MUHSA Simple DC Circuits

Capacitors

Schematic Diagrams

Series Circuits

Parallel Circuits

Simple Harmonic Motion

Pendulum Equation

Wave Components

Mechanical Universe video - Waves

Wave Equation

Ray Diagrams

Refraction

Lenses

Lens Equation

Snell's Law

Atomic Theory

Elements of Physics: Matter - Atoms and Molecules
Fundamental Particles
Duality of Light
Photoelectric Effect
Strong Nuclear Force
Radioactivity
Nuclear Fission and Nuclear Fusion
Special Relativity
Cosmology

Required Materials

Course Objectives

Grading Policy

Communication Policy

Besides engaging students in challenging curriculum, FLVS guides students to reflect on their learning and evaluate their progress through a variety of assessments. Assessments can be in the form of self-checks, practice lessons, multiple choice questions, writing assignments, projects, essays, labs, oral assessments, and discussions. Instructors evaluate progress and provide interventions through the variety of assessments built into a course, as well as through contact with the student in other venues