



<b>Course Code</b> PHYS-110	<b>Course Title</b> Elements of Physics	<b>ECTS Credits</b> 6
<b>Department</b> Electrical & Computer Engineering	<b>Semester</b> Spring	<b>Prerequisites</b> None
<b>Type of Course</b> Required	<b>Field</b> Science	<b>Language of Instruction</b> English
<b>Level of Course</b> 1 <sup>st</sup> Cycle	<b>Year of Study</b> 1 <sup>st</sup>	<b>Lecturer(s)</b> Dr Marios Nestoros
<b>Mode of Delivery</b> Face-to-face	<b>Work Placement</b> N/A	<b>Co-requisites</b> None

**Objectives of the Course:**

The aims of this course are to:

- Give students an introduction to some of the essential principles of classical physics
- Enable students to describe qualitatively and quantitatively, physical changes taking place in the world around them.
- Encourage students to use critical thinking to discuss and analyze examples drawn from sports, medicine, biology and everyday life.

**Learning Outcomes:**

After completion of the course students are expected to:

- Assign the correct units of measurement to physical quantities and convert from one unit of measurement to another.
- Describe the motion of a particle in one and two dimensions using the quantities of velocity, acceleration and displacement.
- Clarify the relation between force and acceleration in an inertial frame of reference and apply Newton's Laws.
- Define and apply the principles of conservation of energy, linear momentum and angular momentum.
- Identify the transformation of energy from one form to the other and use conservation of energy to solve problems.
- Identify wave motion and the common behavior (interference, diffraction) of different types of waves (sound, electromagnetic).
- Apply the laws of geometrical optics for lenses and mirrors.
- Define Coulomb force, electric field and voltage difference
- Analyze basic electric circuits (involving capacitors, resistors) and identify energy transformations related to such circuits.

**Course Contents:**Lectures

1. Measurement and Fundamental Units
2. Motion in one and two dimensions
3. Force and Motion
4. Work, Forms of Energy and Conservation of Energy
5. Linear Momentum, Torque, Angular Momentum
6. Oscillations and Waves
7. Static and Dynamic Electricity
8. Light, Optics and the Electromagnetic Spectrum

Demonstrations and Simulations:

Selection of and simulations/demonstrations from: free fall, projectile motion, Newton's Laws of Motion, statics and elasticity, conservation of mechanical energy, conservation of momentum, waves, electricity

**Teaching Methods:**

Lectures (2 hours/week); Tutorial (1 hour/week)

**Assessment Methods:**

Quizzes, Mid-Term Exam, Final Examination

**Required Textbooks:**

Authors	Title	Publisher	Year	ISBN
Hans C Ohanian	Principles of Physics	W. N. Norton	1st Edition	039395773x

**Recommended Textbooks/Reading:**

Authors	Title	Publisher	Year	ISBN
Ben Crowell	Conceptual Physics <a href="http://www.lightandmatter.com/">http://www.lightandmatter.com/</a>			