



## General Physics Laboratory (1)

Course Code	Course Num.	Course Name	Credit Hours	Lec.	Lab.	Tut.	Co-requisites
PHY	181	General Physics Laboratory	1	0	2	0	PHY101

### Objectives:

This course is designed to give students a background in experimental techniques and to reinforce instruction in physical principles in the theoretical courses, and Enable the student to understand natural phenomena in simple mathematical formulas and graphs to be familiar with different physical quantities.

Summary of Intended Learning Outcomes:

- Understand the world around through observations.
- Explain the underlying physical concepts at Lab throughout experimental work.
- Wield mathematical formulas and graphs in the context of everyday situations to make predictions of the physical quantities.
- Develop skill in actively performing elementary physics experiments with different lab partners to obtain satisfactory results.
- Write using correct data collection, organization and analysis techniques, a complete formal laboratory report to include: title of experiment, Objectives, data and observations, results and conclusions.

### Syllabus:

**Introduction:** Fundamentals of Data Analysis and graphs Student gain experience in the graphical presentation and interpretation of data.

**Experiment 1:** Measurements and Uncertainties:

Use of various measuring devices such as ruler, vernier caliper and micrometer, and then to estimate the errors of measurements performed.

**Experiment 2:** Free Fall Demonstrate that the acceleration due to gravity of an object is constant, and to determine the numerical value of that acceleration.

**Experiment 3:** Conservation of mechanical Energy Confirming the law of conservation of mechanical energy, and verifying by graph that The total mechanical energy  $E$ , of any isolated system of objects that interact only through conservative forces, is defined as the sum of the kinetic and potential energies.

**Experiment 4:** Simple Pendulum a mass  $m$  hanging at the end of a string of length  $L$ . The period of a pendulum as oscillatory motion is measured as a function of string length, from which the acceleration due to gravity could be calculated.

**Experiment 5:** Force Table and Forces in Equilibrium Determine the force which balance other forces experimentally and checked the results by using the components & graphically methods for adding forces.

**Experiment 6:** Elastic Constant & Hooke's Law: Determining the change of length  $s$  of two helical springs with different turn diameters as a function of the gravitational force exerted by the suspended weights, Confirming Hooke's law and determining the spring constant  $k$  of the two helical springs, confirming the law of spring's connection.

**Experiment 7:** Simple Harmonic motion Measure the position of an oscillating mass as a function of time, The dependence of oscillation period on the mass applied and the spring constant will be studied.

**Experiment 8:** Newton's second law for friction Friction air track will be used to test the validity of Newton's Second Law, by calculating the acceleration "a" of the trolley and friction coefficient of certain surface.

### References:

- Laboratory Manual supplied by the department of Physics.

