GENERAL PHYSIC

PH 103 : 3 Credit hours (2 lectures, 2 lab, 0 exercises)

Prerequisites:

No prerequisites.

Objectives:

Students will develop an understanding of some of the fundamental of classical mechanics, laws of nature and their mathematical representation. They will extend their understanding of macroscopic phenomena to include the effects of stationary and moving charges and the role they play in electric and magnetic phenomena. These will provide students with skills such as:

- To understand the laws of electricity and magnetism which have a central role in operation of devices such as radios, television, electric motors, computers and electronic devices.
- The ability to apply basic physical theory to the world around them.
- The ability to communicate ideas and observations using written and pictorial methods.
- The ability to interpret instructions and carry out practical experiments safely.

Course Description:

This Course Teaches General physic.

Contents:

-Major Topic Covered in the course

- Vectors: Coordinate systems, vector and scalar quantities, some properties of vectors, components of a vector and unit vectors, the scalar product of two vectors , the cross product of two vectors.
- Motion in one dimension: Displacement, velocity and acceleration vectors, one-dimensional motion with constant acceleration, and motion in tow dimensions.
- Work and kinetic energy: work done by a constant force, kinetic energy and the work-kinetic energy theorem.
- Electric field : properties of electric charges, insulators and conductors, Coulomb's law, electric field created by one charge and group of charges, electric field lines, motion of charged particles in uniform electric field.
- Electric potential: potential difference and electric potential, potential difference in a uniform electric field, electric potential and potential energy due to point charges.
- Capacitance: definition of capacitance**,** calculating Capacitance for parallel plate capacitors**,** connection of capacitors**,** energy stored in a charged capacitor**.**
- Current and resistance: Electric current, resistance and Ohm's law, electrical energy and power.
- Direct current circuits: electromotive force, resistors in series and parallel, kirchhoff's rules, RC circuits.
- Magnetic fields: the magnetic field, magnetic force on a current-carrying conductor, motion of a charged particle in a magnetic field.
- Sources of the magnetic field: the Biot-Savart law, the magnetic force between two parallel conductors, Ampere's law, the magnetic field of a solenoid

References:

- Physics for Scientists and Engineers (with modern physics) –by Raymond A. Serway, and John W. Jewett – Brooks Cole – 6th Edition (July 21, 2003)
- Physics for scientists and engineers with modern physics Randall D. Knight, (December, 2003)