Course Name: Principles of Physics-1 **Course Code:** PHYS204

General Information						
Course Code	**PHYS204**	**Level/Year**	**3/2**	**Required (R) / Selected Elective (SE)**		**R**
Credit Hours	**Theory**	**3**	**Lab**	**1**	**Total**	**4**
Prerequisites	**Nil**	**Course Coordinator**		Dr. Samar Ghopry		
Corequisites	**Nil**					

Course Description

This is a fundamental course of physics that covers mechanics, elasticity and fluid mechanics, oscillations and mechanical waves, thermodynamics, and electricity.

Course Objectives : On completion of the course, the student will be able to:

- **Apply** the concepts of units, dimensions, vectors, and kinematics to analyze motion in one and two dimensions.
- **Explain** Newton's laws of motion and their applications to linear and rotational dynamics of rigid bodies.
- **Analyze** the behavior of materials under stress and strain, and describe the principles of fluid statics and dynamics.
- **Examine** the principles of oscillatory motion, mechanical waves, and sound propagation.
- **Interpret** the laws of thermodynamics and their applications in understanding temperature, heat transfer, and thermal processes.
- **Evaluate** electric fields, electric potential, electric current, resistance, and power in basic electrical circuits.

Course Contents

List of Topics

1) Physics and Measurements
2) Vectors
3) Motion in one and two dimensions
4) The Laws of Motion
5) Rotation of a rigid object
6) Elasticity and Fluid Mechanics
7) Oscillations and mechanical waves
8) Thermodynamics
9) Electricity

Textbook

• Physics for Scientists & Engineers with Modern Physics; Raymond A. Serway and John W. Jewett, 2008.	
Reference Materials	
• College Physics; Raymond A. Serway, Charis Vuille, Jerry S. Faughn, Brooks/Cole, 2009. • Fundamentals of Physics; Halliday, Resnik and Walker, John Wiley and Sons, 2014, 10th Edition.	
Course Learning Outcomes	
CLO#01	Recall units of physical quantities, vector quantity, scalar quantity, Newton's laws, conservation law of mechanical energy, and conservation law of linear momentum.
CLO#02	Define all the physical quantities related to unit and dimensions, basic principles of mechanics, heat, fluids, elasticity, electric& magnetic fields, and basic ray optics, laws of motion, Newton's laws.
CLO#03	Solve problems related to dimensional analysis, vectors, rotational dynamics, elasticity, viscosity, laws of motion, heat, sound waves electric & magnetic forces.
CLO#04	Perform experiments using different analog and digital devices and plot the characteristics of different types of devices
CLO#05	Develop communication competencies during interactive discussions, and group assignments.
CLO#06	Demonstrate skills to work in groups.