Level One

General Physics (1)

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| **Course Code** | **Course Num.** | Course Name | **Credit Hours** | **Lec** | **Lab** | **Tut** | **Prerequisites** |
| PHY | 101 | General Physics (1) | 3 | 3 | 0 | 1 |  |

*Objectives:*

Students will develop an understanding of some of the fundamental laws of nature and their mathematical representation.

***Syllabus:***

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| **Contents** | **Chapter** | **Duration** |
| * Motion in one dimension: Displacement, velocity and acceleration, one dimensional motion with constant acceleration, freely falling objects. | **2** | **2** |
| * Vectors: Vector and scalar quantities, some properties of vectors, components of a vector and unit vectors | **3** | **1.5** |
| * The laws of motion: the concept of force, Newton’s first law, Newton’s second law, the force of gravity and weight, Newton’s third law, some applications of Newton’s laws, forces of friction. | **5** | **2** |
| * Work and kinetic energy: the scalar product of two vectors, work done by a constant force, kinetic energy and the work-kinetic energy theorem. | **7** | **1.5** |
| * Potential energy and conservation of energy: Potential energy, conservative and non conservative forces, conservative forces and potential energy, conservation of mechanical energy, work done by non-conservative forces.Power | **8** | **2** |
| * 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. | **23** | **2** |
| * Electric potential:potential difference and electric potential, potential difference in a uniform electric field, electric potential and potential energy due to point charges. | **25** | **1** |
| * Capacitance:definition of capacitance**,** calculating Capacitance for parallel plate capacitors**,** connection of capacitors**,** energy stored in a charged capacitor**.** | **26** | **1.5** |
| Direct Current:electromotive force electric current**,** resistance and resistivity**,** Ohm's law**,** connection of resistors**,** electric energy and power**,** Kirchhoff’s rules. | **27-28** | **2.5** |

***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)