**GENERAL PHYSICS (103)/ INTRODUCTORY MECHANICS (4 Cr.)**

**Pre-requisite:** Intermediate with Physics or O/A Level Physics

**Learning Objectives:**

Student will learn the fundamental physics of Mechanics and its applications in everyday life. Evaluations and exams will be based on analytical and conceptual problems. Students shall be made to solve question and exercises at the end of each chapter.

**Recommended books:**

1. **Fundamentals of Physics by Halliday/Resnick/Walker**
2. University Physics(Models and Applications) by William P. Crummett
3. The Feynman Lectures on Physics Volume I

**Course Outlines/Topics (Textbook of Halliday/Resnick/Walker):**

**Ch-1: Measurements**

Physical quantities, SI units, Measurements, Accuracy, Precision, Errors and Uncertainties.

**Ch-2: Vectors**

Vector and Scalars, Addition and multiplications of vectors.

**Ch-3: Motion along a straight line**

Description of motion, Velocity, Acceleration, Freely falling bodies.

**Ch-4: Motion in 2-D & 3-D**

Motion in two dimensions, Projectile motion.

**Ch-5: Force and Motion**

Circular motion, Newton’s Laws, Applications of Newton’s Laws, Frictional Forces, Drag force.

**Ch-6: Kinetic Energy and Work**

Work done by constant and variable force, Work-Energy theorem, Power.

**Ch-7: Potential Energy and Conservation of Energy**

Conservative forces, Mass and Energy relationship, Potential energy, Conservation of mechanical energy.

**Ch-8: Systems of Particles**

Center of mass, Linear momentum and its conservation, Newton’s 2nd law. Introduction to elastic and inelastic collisions.

**Ch-9: Rotation**

Rotational Motion, Relation with linear variables, Angular momentum & its conservation.

**Ch-10: Oscillations and Circular motion**

Oscillations, Simple harmonic motion, Energy in SHM, Uniform circular motion.

**Ch-11: Gravitation**

Newton’s Gravitational Law, Motion of planets and satellites, Kepler’s laws,

**Course evaluation:**

Mid-term exam (20%), Final exam (20%), Quizzes or assignments (20%), Project or Presentation (25%) and Lab (15%).

**Syllabus**: MID Term Exam: Chapter 1-7

FINAL Term Exam: Chapter 8-12

**Attendance and Grading Scale policy:**

Students must attend all the lectures. If attendance of any student falls below 70%, he/she will not be allowed to sit in the final exam. FCCU grading scale policy will be followed to calculate grades and quality points.