Level Two

Classical Mechanics (1)

Course Code	Course Num.	Course Name	Credit Hours	Lec	Lab	Tut	Prerequisites
PHY	105	Classical Mechanics (1)	3	3	2	1	PHY 101

Objectives:

To increase the students understanding of the motion of objects through space and time that are applicable to every day situations.

Syllabus:

- Linear Momentum and Collisions: linear momentum and its conservation, impulse and momentum, collisions in one dimension, two-dimensional collisions, the center of mass, motion of a system of particles.
- Rotation of a Rigid Object about a Fixed Axis: Angular position, velocity and acceleration, rotational kinematics (rotational motion with constant angular acceleration), angular and linear quantities, rotational kinetic energy, calculation of moments of inertia, torque, relationship between torque and angular acceleration, work and energy in rotational motion.
- Angular Momentum: the vector product and torque, angular momentum, angular momentum of a rotating rigid object, conservation of angular momentum.
- Static Equilibrium: the conditions of equilibrium, more on the center of gravity, examples of rigid objects in static equilibrium.
- Universal Gravitation: Newton's law of universal gravitation. Free-fall acceleration and the gravitational force, Kepler's laws and the motion of planets, gravitational potential energy, energy considerations in planetary and satellite motion.
- Oscillatory Motion: Motion of an object attached to a spring, Mathematical representation of simple harmonic motion, Energy of the simple harmonic motion, The pendulum, Damped oscillations, Forced oscillations.

References:

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