Code	Subject Title	Cr. Hrs	Semester
PHY-111	Physics-I (Mechanics & Optics)	3	I

Year	Discipline
1	Chemistry-II, Mathematics-I, Statistics-I

Mechanics Vector Operations

Vector in 3 dimensions; Vector derivatives and operation; Gradient, Divergence and Curl of a vector; Divergence Theorem; Stokes Theorem.

Particle Dynamic

Advanced application of Newton's laws Dynamics of Uniform motion; Equations of motion; Time dependent forces; Effect of drag forces on motion; Non inertial frames and pseudo forces; Non inertial frames and Pseudo forces; Limitations of Newton's Laws.

Work, Energy and Power

Work done by a constant force, work done by a variable force (1-dimensions); Work done by a variable (2-dimension) Work energy theorem, General proof of work energy theorem. Power: Reference Frames.

Conservation of Energy

Conservative, and non conservative forces; One dimensional conservative system; 2,3 dimensional conservative system; Conservation of energy in a system of particles system two practical system. Center of mass of solid object; Momentum changes in system of variable mass.

Collisions

Inelastic collision conservation of momentum during collision in center of Mass reference frame.

Rotational Dynamics

Angular momentum; angular velocity; Overview of rotational Dynamics; Parallel axis theorem; Determination of momentum of interstice of various shapes; Rotational dynamics of rigid bodies; combined rotational and transitional motion. Stability of spinning objects, the spinning Top.

Gravitation

Review of basic concepts of gravitation. Gravitational effect of a spherical mass distribution; Gravitational Potential Energy; Gravitational field & potential; Universal Gravitational Law.

Bulk Properties of Matters

Elastic Properties of Matter; Fluid Statistics; Fluid Dynamics; Bernoulli Equation; Viscosity.

Optic Topic

Nature of light; Light as an Electro magnetic wave; Interference; Adding of Electromagnetic wave using phasors; Interference from thin films; Michelson Interferometer; Fresnel Biprism and its use; Diffraction; Diffraction from multiple slits; Diffraction grating; Holography; Polarization; Description of polarization states; Rotation of plane of polarization.

Recommended Books:

1. Physics Vol. I & II (extended) by Resnick, Halliday and Karne, 4th and Sons Inc, New York.
2. Fundamentals of Physics by Halliday Resnick and Krane, John Wiley and Sons Inc, New York.

3. University Physics 8th Edition by Sears, Zemansky and Young, Addison – Wesley, Reading (MA), USA
4. Physics by Alonso and Finn; Addison-Wesley, Reading (MA) USA.