

COURSE STRUCTURE WITH CREDIT WEIGHTAGE OF PHYSICS FOR BACHELORS IN SCIENCE (GENERAL) 2020 AND ONWARDS:

Sem	Course Code	Course Type	Course Title	Number of Credits	
				Theory	Practical
I	PH120C	DSC	Physics: Mechanics	4	2
II	PH220C	DSC	Physics: Electricity and Magnetism	4	2
III	PH320C	DSC	Physics: Thermal Physics	4	2
IV	PH420C	DSC	Physics: Waves and Optics	4	2
V	PH520D	DSE	Physics: Modern Physics - I	4	2
VI	PH620D	DSE	Physics: Modern Physics - II	4	2

Semester - I (Core Course)	PHY120C: PHYSICS: MECHANICS	Theory
04 Credits		60 Hours
Unit - I		
Review of Vector Algebra, Gradient, Divergence and Curl of a vector and their significance, Vector triple product. Coordinate systems: Spherical coordinates, Polar coordinates and Spherical Polar coordinates and cylindrical coordinates. Mechanics of a single particle and system of particles: Newton's laws of motion, Mechanics of a particle, Equation of motion of a particle, Motion of a charged particle in an electromagnetic field, Mechanics of a system of particles		
Unit - II		
Special relativity, Time Dilation, Doppler effect, Length Contraction, Twin Paradox, Relativistic momentum, Mass and Energy, Energy and Momentum, General relativity, Einstein's theory of gravitation, Lorentz transformation.		
Unit - III		
Inverse square Law - Field and Potential: Laws of gravitational and electrostatic forces, Gravitational and electrostatic field potentials, Lines of force and equipotential surfaces, Fields and potentials of dipole and quadrupole, Potential due to a charge distribution at large distances, Field equations. Motion in a central force field: Equivalent one body problem, Motion in a central force field, Motion in an inverse square law force field, Equation of orbit, Kepler's laws of planetary motion.		
Unit - IV		
Oscillations: Simple harmonic oscillator, Damped harmonic oscillator, Forced oscillations, Coupled oscillations, Simple pendulum, Compound pendulum.		
Text Books:		
1. <i>Introduction to Classical Mechanis</i> by R G Takwale and P S Purnik. 2. <i>Concepts of Modern Physics</i> by Arthur Beiser.		
Reference Books:		
1. <i>University Physics</i> by F. W. Sears, M. W. Zemansky and H. D. Young 2. <i>Physics</i> by Resnick, Halliday & Walker 3. <i>Engineering Mechanics</i> by Basudeb Bhattacharya 4. <i>Mechanics</i> , D. S. Mathur		

Semester - I (Core Course)	PHY120C: PHYSICS: MECHANICS	Practical
02 Credits		60 Hours
<ol style="list-style-type: none"> 1. Measurements of length (or diameter) using vernier calliper, screw gauge and travelling microscope. 2. To determine the Height of a Building using a Sextant. 3. To determine the Moment of Inertia of a Flywheel. 4. To determine the Young's Modulus of a Wire by Optical Lever Method/bending of beam. 5. To determine the Modulus of Rigidity of a Wire by Maxwell's needle. 6. To determine the Elastic Constants of a Wire by Searle's method. 7. To determine g by Bar Pendulum. 8. To determine g by Kater's Pendulum. 9. To determine g and velocity for a freely falling body using Digital Timing Technique 10. To study the Motion of a Spring and calculate (a) Spring Constant (b) Value of g. 		
<p>Reference Books:</p> <ol style="list-style-type: none"> 1. <i>Advanced Practical Physics for students, B.L.Flint and H.T.Worsnop,</i> 2. <i>Advanced level Physics Practicals, Michael Nelson and Jon M. Ogborn,</i> 3. <i>Engineering Practical Physics, S. Panigrahi & B. Mallick</i> 4. <i>A Text Book of Practical Physics, Indu Prakash and Ramakrishna</i> 		