

Course Title	Physics	
Course Code	BPH101	
Course Credit	Lecture	: 5
	Practical	: 3
	Total	: 8
Course Objectives		
<p>On the completion of the course, students will be able to:</p> <ul style="list-style-type: none"> Understand the fundamentals of Physics. 		
Detailed Syllabus		
Sr. No.	Name of Chapter & Details	Hours Allotted
Section-1		
1	Conservation Laws: Review of Newton's laws of motion, Work, Power, Conservation of Force, Kinetic energy-Work-Energy Principle, Potential energy, The law of Conservation of energy, One dimensional Conservative system, Conservation of linear momentum, Centre of Mass, Collision	6
2	Dynamics of Rigid Bodies: Rotational motion (only definition), Torque acting on a particle, Angular momentum, Relation between Torque and Angular momentum, Moment of Inertia, Expressions for Moment of Inertia, Radius of Gyration, Theorems on Moment of Inertia, Moment of Inertia of a Rectangle, Moment of Inertia of Circular ring, Moment of Inertia of Circular disc.	9

3	Gravitation, Gravity and Satellites : Review of Newton's Gravitational law, Gravitations field & Potential, Relation between Gravitational Potential and Field strength, Potential and Field Due to a Solid Sphere, Gravitational Potential Self Energy, Gravitational Self-Energy, Escape Velocity, Kepler's Laws of Planetary Motion, Proof of Kepler's Laws, Satellites, Time Period of Satellite, State of Weightlessness.	9
4	Elasticity: Introduction, Stress and strain, Hooke's Law (only definition), Young's Modulus, Bulk Modulus, Modulus of Rigidity, Poisson's Ratio, Equivalence of Shear to Compression & Extension (7.8), Relation between Y , K , η & σ , Determination of Young's Modulus by Searle's Method.	6
Section-2		
5	D.C.Circuits & A.C.Circuits: Growth and decay of current in L-R circuit with D.C.source. Charge and discharge of R-C. circuit with D.C. source, A.C.Circuits: Review of Alternating currents, Cycle, Frequency, Phase, R.M.S value of Alternating currents, L-C-R series A.C.source, L-C-R series resonance, Parallel resonance.	9
6	Network Theorems & Multimeter : Constant voltage source, Constant current source, Maximum power transfer theorem, Thevenin's theorem, Norton's theorem, Chassis and ground, Multimeter.	6
7	Structure of The Atom: Failure of Classical Mechanics, Effect of Nuclear Motion on Atomic Spectra, Correspondence Principle, Critical Potentials, Atomic Excitation, Vector Model, Quantum numbers (only definitions).	6
8	Wave Mechanics: De'Broglie wavelength & Phase velocity of De'Broglie's wave, Expression for group velocity, Group velocity of de Broglie's wave, Relation between Phase velocity & Group velocity, Heisenberg's Uncertainty Principle (only), wave mechanical atom model.	9

Laboratory course

LIST OF EXPERIMENTS:

1. Study of errors in observation
2. Bar Pendulum : Determination of 'K' and 'g'
3. Torsion pendulum. (Moment of Inertia of disc & Modulus of rigidity)
4. Young's Modulus of long wire by Searl's method
5. Poisson's ratio of rubber tube
6. Newton's law of cooling and specific heat of liquid.
7. Discharge of Capacitor and RC time constant
8. Verification of Maximum power transfer theorem. (using PCB)
9. Tangent galvanometer (Constant of T.G. & Verification of Ohm's law)
10. Low resistance by Potentiometer

Instructional Method and Pedagogy:

- Lectures will be conducted with the aid of multi-media projector, black board, OHP etc.
- Assignments based on course content will be given to the students at the end of each unit/topic and will be evaluated at regular interval.
- Surprise tests/Quizzes/Tutorials will be conducted.
- The course includes a laboratory, where students have an opportunity to build an appreciation for the concepts being taught in lectures.
- Approximately ten experiments shall be there in the laboratory related to course contents.

Students Learning Outcomes:

At the end of the course the students will be able to:

- Understand basic concepts of linear motion, work, power, energy, moment and conservation of force.
- Understand elastic and inelastic collisions of particles.
- Understand rotational motion, torque and moment of inertia of a rigid body.
- Understand laws of gravitation and laws of satellite motion.
- Understand laws of elasticity.
- Understand DC circuit, AC circuit and network theorems.
- Understand basic structure of atoms and quantum mechanics approach for wave-particle duality

Reference Books:

- Engineering Physics by R.K.Gaur, S.L.Gupta, Dhanpat Rai Publications.
- Principles of Electronics by V.K.Mehta & Rohit Mehta., S.Chand Company.
- Modern Physics by R.Murugesan & Kiruthiga Sivaprasath, S.Chand Comp.
- Waves and Oscillations by Brij Lal and Subrahmaniam. S.Chand comp.