PHYSICS SESSION (20-21)

MONTH: APRIL

Content/ Topic	Week 1	Week 2	Week 3	Week 4	Week 5
Ch-1 Physical world Ch-2 : Units & measurement Ch-3: Motion in Straight line	Ch-1 ➢ Introduction ➢ Nature of Physical laws ➢ Ch-2 ➢ Units of measurement	Ch-2 ➢ systems of units fundamental and derived units ➢ Dimensions of physical quantities	Ch-2 dimensional analysis and its applications ➢ accuracy and precision of measuring instruments ➢ errors in measurement ➢ significant figures C.T -1	Ch-3 ➢ Position-time graph, speed and velocity ➢ Uniform and non-uniform motion ➢ average speed and instantaneous velocity	➢ Uniformly accelerated motion ➢ Velocity-time and position-time graphs
Practical	➢ Vernier Calliper				
Learning Objectives	➢ To differentiate between fundamental and derived units ➢ To understand applications of dimensional analysis. ➢ To understand how errors combine in different mathematical operations as combination of errors				
Expected Learning Outcomes	Students would be able to: ➢ write dimensional formula for given physical quantities ➢ differentiate between, accuracy and precision in measurements ➢ differentiate between systematic errors and random errors				
Teaching Aids	Chalkboard, charts/power point presentations				
Assessment	class assignments, homework assignments				

MONTH : MAY

Content/ Topic	Week 1	Week 2	Week 3	Week 4	Week 5
Ch-3: Motion in a straight line **Ch-4 : Motion in a Plane**	**Ch-3** ➢ **Relations for uniformly accelerated motion (graphical treatment)**	➢ **Elementary concepts of differentiation and integration for describing motion** ➢ **Relative velocity in One-dimension** **C.T-2**	**Ch-4** ➢ **Scalar and vector quantities** ➢ **Position and displacement vectors** ➢ **equality of vectors, Laws of vector addition- triangle & parallelogram law of vectors** **PT-I**	**Ch-4** ➢ **Relative velocity** ➢ **Unit vector** ➢ **Resolution of a vector in a plane - rectangular components** **PT-I**	**Ch-4** ➢ **Projectile Motion** ➢ **Uniform circular motion** ➢ **Revision** **C.T -3**
Practical	➢ **Screw Gauge**				
Learning Objectives	➢ **To Differentiate between average and instantaneous velocity** ➢ **To obtain "equations of motion" for a uniformly accelerated motion** ➢ **To Understand laws of vector addition**				
Expected Learning Outcomes	**Students would be able to:** ➢ **draw position-time and velocity-time graphs for a uniform motion** ➢ **Interpret the type motion from x-t, v-t & a-t graphs** ➢ **Solve problems using equations of motion and relative velocity.**				
Teaching Aids	**Chalkboard, charts/power point presentations**				
Assessment	**class assignments, homework assignments**				

MONTH : JULY

Content/ Topic	Week 1	Week 2	Week 3	Week 4	Week 5
Ch-5 : Motion in a Plane Ch-6: Laws of Motion	Ch-5 ➢ Inertia ➢ Newton's laws of motion ➢ Revision of previous chapters and test	Ch-5 ➢ Law of conservation of linear momentum and its applications Equilibrium of concurrent forces	➢ Static and kinetic friction ➢ laws of friction ➢ rolling friction Centripetal force	➢ Circular motion -vehicle on level circular road, vehicle on banked road C.T-4	Ch-6 ➢ Work done by a constant force and a variable force ➢ kinetic energy, ➢ energy conservation of mechanical energy
Practical	➢ Parallelogram law of vectors (verification) ➢ Parallelogram law of vectors (unknown body)				
Learning Objectives	➢ To state the three laws of motion ➢ To understand the types of friction ➢ To understand the motion of vehicle on a curved level road and banked road				
Expected Learning Outcomes	The students would be able to: ➢ Solve problems related to impulse and change in momentum ➢ explain the graphical variation of friction v/s apllied force ➢ Explain the motion of a vehicle on banked road and appreciate how the banking of roads can help to reduce the wear & tear of tyres.				
Teaching Aids	Chalkboard, charts/power point presentations				
Assessment	class assignments, homework assignments				

MONTH : AUGUST

Content/ Topic	Week 1	Week 2	Week 3	Week 4	Week 5
Ch- 6: Work, Energy & Power Ch-7: Rotational Motion	-------	Ch - 6 ➢ work-energy theorem ➢ Power ➢ Potential energy of a spring ➢ conservative forces, non-conservative forces	➢ Motion in a vertical circle ➢ Elastic and inelastic collisions in one and two dimensions C.T-5	Ch-7 Centre of mass of a two-particle system ➢ momentum conservation and centre of mass motion ➢ Torque of rigid bodies	➢ angular momentum ➢ Law of conservation of angular momentum and its application ➢ Equilibrium, Moment of inertia ➢ radius of gyration C.T -6
Practical	➢ Coefficient of limiting friction ➢ Helical Spring experiment				
Learning Objectives	➢ To Differentiate between conservative and non-conservative forces ➢ To distinguish between elastic and inelastic collisions, with examples ➢ To distinguish between the centre of mass and the centre of gravity of a rigid body				
Expected Learning Outcomes	The students would be able to: ➢ Give examples of conservative & non-conservative forces ➢ solve problems on motion in a vertical circle ➢ solve problems on calculation of centre of mass for a system of particles				
Teaching Aids	Chalkboard, charts/power point presentations				
Assessment	class assignments, homework assignments				

MONTH : SEPTEMBER

Content/ Topic	Week 1	Week 2	Week 3	Week 4	Week 5
Ch-7: Rotational Motion	➢ **Revision**	**Term-I**	**Term-I**	**Term-I**	**Term-1 Exams End+ Paper distribution**
Prcactical	➢ **Spherometer**				
Learning Objectives	➢ **To Understand the moment of inertia of different bodies (shapes)** ➢ **To differentiate between gravitational potential energy and gravitational potential**				
Expected Learning Outcomes	**The students would be able to:** ➢ **apply the theorems of parallel and perpendicular axis in appropriate given situations** ➢ **obtain expression for the kinetic energy of rolling motion**				
Teaching Aids	**Chalkboard, charts/power point presentations**				
Assessment	**class assignments, homework assignments**				

MONTH : OCTOBER

Content/ Topic	Week 1	Week 2	Week 3	Week 4	Week 5
Ch-8 : Gravitation **Ch-9: Mechanical properties of solids** **Ch-10: Mechanical properties of fluids**	**Ch-7** ➢ **Parallel and perpendicular axes theorems and their application**	**Ch-7** ➢ **Rolling without slipping** **Chap -8** ➢ **The universal law** ➢ **Properties of gravitational force** ➢ **Acceleration due to gravity and its variation with altitude and depth**	**Chap 8** ➢ **Gravitational potential energy and potential** ➢ **Escape velocity** ➢ **Orbital velocity of a satellite** ➢ **Geo-stationary & Polar satellites, Kepler's laws** **C.T-7**	**Chap 9** ➢ **Elastic behavior** ➢ **Stress-strain relationship** ➢ **Hooke's law** ➢ **Young's modulus** ➢ **bulk modulus** ➢ **shear modulus of rigidity** **C.T-8**	**Ch-10** ➢ **Pressure due to a fluid column** ➢ **Pascal's law and itsapplications(hydraulic lift and hydraulic brakes**
Practical	➢ **Beam Balance** ➢ **Young's modulus experiment**				
Learning Objectives	➢ **To differentiate between gravitational potential energy and gravitational potential** ➢ **To differentiate between different types of stress** ➢ **To understand the concept of friction in the context of fluids in motion** ➢ **To differentiate between streamline and turbulent flow**				
Expected Learning Outcomes	**The students would be able to:** ➢ **explain the variation of 'g' with depth, altitude, rotation of earth etc.** ➢ **describe how different moduli of elasticity correspond to different kinds of stress and strain** ➢ **explain how pascal's law is applied in hydraulic lifts and breaks.** ➢ **describe why a raindrop would attain a terminal velocity as it descends under gravity**				

Teaching Aids	**Chalkboard, charts/power point presentations**	
Assessment	**class assignments, homework assignments**	

MONTH : NOVEMBER

Content/ Topic	Week 1	Week 2	Week 3	Week 4	Week 5
Ch-10: Mechanical properties of fluids **Ch-11: Thermal properties of matter**	**Chap -10** ➢ Viscosity, Stokes' law ➢ terminal velocity ➢ Streamline and turbulent flow ➢ Reynolds's number & critical velocity ➢ Bernoulli's theorem and its applications	➢ Surface energy and surface tension ➢ angle of contact, ➢ application of surface tension ideas to drops, bubbles ➢ Capillary rise C.T-9	**Ch-11** ➢ Heat& temperature ➢ Thermal expansion of solids, liquids and gases ➢ anomalous expansion of water ➢ Specific heat capacity Cp, Cv	**Ch -11** ➢ Calorimetry ➢ Change of state - latent heat capacity ➢ Heat transfer- conduction, convection and radiation	
Practical	➢ Terminal velocity ➢ Surface Tension of water by capillary rise method				
Learning Objectives	➢ To define surface tension and relate it to surface energy ➢ To comprehend the concept of latent heat ➢ To differentiate between conduction, convection, and radiation.				
Expected Learning Outcomes	The students would be able to: ➢ list some of the common applications of Bernoulli's principle ➢ describe anomalous expansion of water ➢ describe the phenomenon of black body radiation and list some examples in our daily life				

Teaching Aids	**Chalkboard, charts/power point presentations**	
Assessment	**class assignments, homework assignments**	

MONTH : DECEMBER

Content/ Topic	Week 1	Week 2	Week 3	Week 4	Week 5
Ch-12: Thermodynamics **Ch-13: kinetic theory of gases**	**CH-11** ➢ **Thermal conductivity** ➢ **Newton's law of cooling** ➢ **Qualitative ideas of Blackbody radiation** ➢ **Wien's displacement Law, Stefan's law** **C.T-10**	**Ch-12** ➢ **Thermal equilibrium** ➢ **zeroth law of thermodynamics** ➢ **Heat, work and internal energy** ➢ **First law of thermodynamic** ➢ **Isothermal and adiabatic processes** **PT-2**	➢ **Second law of thermodynamic** ➢ **Reversible and irreversible processes.** ➢ **Heat engine** ➢ **Refrigerator** ➢ **Carnot Engine** **PT-2**	**Ch 13** ➢ **Kinetic theory of gases - assumptions** ➢ **-- concept of pressure** ➢ **Kinetic interpretation of temperature** ➢ **degrees of freedom** ➢ **law of equipartition of energy** **PT-2**	**Ch-14** ➢ **Periodic motion - time period, frequency, displacement as a function of time** ➢ **Periodic functions** **Simple harmonic motion (S.H.M) and its equation; phase**
Practical	➢ **Sonometer** ➢ **Resonance tube experiment**				
Learning Objectives	➢ **To understand the concept of adiabatic, isothermal, isobaric and isochoric processes** ➢ **To understand that a refrigerator can be viewed as the reverse of heat engine** ➢ **To recognize that pressure in a gas originates from kinetic energy of the molecules** ➢ **To understand the concept of degrees of freedom**				

Expected Learning Outcomes	**The students would be able to:** ➢ **give examples of reversible and irreversible processes** ➢ **draw P-V diagrams for isothermal, isobaric, isochoric and adiabatic process** ➢ **describe kinetic interpretation of temperature** ➢ **find the degrees of freedom for monoatomic and diatomic gases**
Teaching Aids	**Chalkboard, charts/power point presentations**
Assessment	**class assignments, homework assignments**

MONTH : JANUARY

Content/ Topic	Week 1	Week 2	Week 3	Week 4	Week 5
Ch-14: Oscillations Ch-15: Waves	Vacations	Vacations	Ch-14 ➢ oscillations of a spring– restoring force and force constant ➢ Kinetic and potential energies of S.H.M. ➢ Simple pendulum ➢ Free, forced and damped oscillations, resonance C.T-13	Ch-15 Wave motion- Transverse and longitudinal waves ➢ speed of wave motion ➢ Displacement relation for a progressive wave ➢ Principle of superposition of waves ➢ reflection of waves	CH-15 ➢ standing waves in strings ➢ organ pipes ➢ fundamental mode and harmonics ➢ Beats ➢ Doppler effect C.T -14
Practical	➢ Simple pendulum				
Learning Objectives	➢ To comprehend the concept of phase ➢ To derive equations of displacement, velocity & acceleration of a particle executing SHM.				
Expected Learning Outcomes	The students would be able to: ➢ graphically show the phase difference between displacement, velocity & acceleration of a body executing SHM ➢ give examples of damped and undamped oscillations				
Teaching Aids	Chalkboard, charts/power point presentations				
Assessment	class assignments, homework assignments				

MONTH :FEBRUARY

Content/ Topic	Week 1	Week 2	Week 3	Week 4	Week 5
Ch-15: Waves	REVISION	TERM-2 EXAM		TERM-2 EXAM	
Practical	➢ Practice of the experiments				
Learning Objectives	➢ To understand the terms representing amplitude, phase, angular frequency and the wave number in the equation for a travelling wave ➢ To state and interpret the expression for the speed of transverse waves on a stretched string and the speed of longitudinal waves in air ➢ To understand the conditions for formation of stationary/standing waves ➢ To explain the phenomenon of beats				
Expected Learning Outcomes	The students would be able to: ➢ differentiate between progressive and stationary waves ➢ describe the concepts of normal modes of oscillation, fundamental mode and harmonics ➢ recognize the nodes and the antinodes in a stationary wave				
Teaching Aids	Chalkboard, charts/power point presentations				
Assessment	class assignments, homework assignments				