



**ARMY PUBLIC SCHOOL RAKHMUTHI**  
**SYLLABUS OF PHYSICS (SPLIT-UP)**  
**CLASS-XI (SESSION 2023-24)**

	UNIT	CONTENT	ACTIVITIES/PROJECT WORK
MAY	<b>Chapter–2: Units and Measurements</b>  <b>Chapter–3: Motion in a Straight Line</b>	<b>Chapter–2: Units and Measurements</b>  Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. significant figures. Dimensions of physical quantities, dimensional analysis and its applications.  <b>Chapter–3: Motion in a Straight Line</b>  Frame of reference, Motion in a straight line, Elementary concepts of differentiation and integration for describing motion, uniform and non-uniform motion, and instantaneous velocity, uniformly accelerated motion, velocity - time and position-time graphs. Relations for uniformly accelerated motion (graphical treatment).	1. To measure diameter of a small spherical/cylindrical body and to measure internal diameter and depth of a given beaker/calorimeter using Vernier Callipers and hence find its volume.  2. To measure diameter of a given wire and thickness of a given sheet using screw gauge.
JUNE      UT-1	<b>Chapter–4: Motion in a Plane</b>           <b><u>REVISION OF SYLLABUS</u></b>	<b>Chapter–4: Motion in a Plane</b>  Scalar and vector quantities; position and displacement vectors, general vectors and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors, Unit vector; resolution of a vector in a plane, rectangular components, Scalar and Vector product of vectors.  Motion in a plane, cases of uniform velocity and uniform acceleration- projectile motion, uniform circular motion. CHAPTER: 1 AND 2	3. To determine radius of curvature of a given spherical surface by a spherometer.  4. To determine the mass of two different objects using a beam balance.
JULY	<b>Chapter–5: Laws of Motion</b>	<b>Chapter–5: Laws of Motion</b>  Intuitive concept of force, Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion.  Law of conservation of linear momentum and its applications	
AUGUST	<b>Chapter–6: Work, Energy and Power</b>	<b>Chapter–6: Work, Energy and Power</b>  Work done by a constant force and a variable force; kinetic energy, work- energy theorem, power.  Notion of potential energy, potential energy of a	

	<p><b>Chapter–7: System of Particles and Rotational Motion</b></p>	<p>spring, conservative forces: non- conservative forces, motion in a vertical circle; elastic and inelastic collisions in one and two dimensions.</p> <p><b>Chapter–7: System of Particles and Rotational Motion</b></p> <p>Centre of mass of a two-particle system, momentum conservation and Centre of mass motion. Centre of mass of a rigid body; centre of mass of a uniform rod. Moment of a force, torque, angular momentum, law of conservation of angular momentum and its applications.</p> <p>Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions.</p> <p>Moment of inertia, radius of gyration, values of moments of inertia for simple geometrical objects (no derivation).</p>	
<p>SEPTEMBER</p>	<p><b>Chapter–8: Gravitation</b></p>	<p><b>Chapter–8: Gravitation</b></p> <p>Kepler's laws of planetary motion, universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth. Gravitational potential energy and gravitational potential, escape velocity, orbital velocity of a satellite</p>	
	<p>HALF YEARLY</p>	<p>CHAPTER: 2,3,4,5,6,7 AND 8</p>	
<p>OCTOBER</p>	<p><b>Chapter–9: Mechanical Properties of Solids</b></p> <p><b>Chapter–10: Mechanical Properties of Fluids</b></p>	<p><b>Chapter–9: Mechanical Properties of Solids</b></p> <p>Elasticity, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity (qualitative idea only), Poisson's ratio; elastic energy.</p> <p><b>Chapter–10: Mechanical Properties of Fluids</b></p> <p>Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes), effect of gravity on fluid pressure.</p> <p>Viscosity, Stokes' law, terminal velocity, streamline and turbulent flow, critical velocity, Bernoulli's theorem and its simple applications.</p> <p>Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, application of surface tension ideas to drops, bubbles and capillary rise.</p>	

NOVEMBER	<p><b>Chapter–11: Thermal Properties of Matter</b></p> <p><b>Chapter–12: Thermodynamics</b></p>	<p><b>Chapter–11: Thermal Properties of Matter</b> Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; <math>C_p</math>, <math>C_v</math> - calorimetry; change of state - latent heat capacity. Heat transfer-conduction, convection and radiation, thermal conductivity, qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law .</p> <p><b>Chapter–12: Thermodynamics</b> Thermal equilibrium and definition of temperature zeroth law of thermodynamics, heat, work and internal energy. First law of thermodynamics, Second law of thermodynamics: gaseous state of matter, change of condition of gaseous state -isothermal, adiabatic, reversible, irreversible, and cyclic processes.</p>	<p>5. To determine Young's modulus of elasticity of the material of a given wire.</p> <p>6. To find the force constant of a helical spring by plotting a graph between load and extension</p>
<p>DECEMBER</p> <p>UNIT TEST-2</p>	<p><b>Chapter–13: Kinetic Theory</b></p> <p><u>REVISION OF SYLLABUS OF UT-II</u></p>	<p><b>Chapter–13: Kinetic Theory</b> Equation of state of a perfect gas, work done in compressing a gas. Kinetic theory of gases - assumptions, concept of pressure. Kinetic interpretation of temperature; rms speed of gas molecules; degrees of freedom, law of equi-partition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.</p> <p>CHAPTER: 9,10 AND 11</p>	<p>7. To study the variation in volume with pressure for a sample of air at constant temperature by plotting graphs between P and V, and between P and <math>1/V</math>.</p> <p>8. To determine the surface tension of water by capillary rise method.</p>
JANUARY	<p><b>Chapter–14: Oscillations</b></p> <p><b>Chapter–15: Waves</b></p>	<p><b>Chapter–14: Oscillations</b> Periodic motion - time period, frequency, displacement as a function of time, periodic functions and their application. Simple harmonic motion (S.H.M) and its equations of motion; phase; oscillations of a loaded spring- restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum derivation of expression for its time period.</p> <p><b>Chapter–15: Waves</b> Wave motion: Transverse and longitudinal waves, speed of travelling wave, displacement relation for a progressive wave, principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, fundamental mode and harmonics, Beats</p>	
FEBRUARY FINAL EXAM	REVISION OF WHOLE SYLLABUS	CHAPTER: 2,3,4,5,6,7,8,9,10,11,12,13,14 AND 15.	ACTIVITIES : 1 TO 8