

**Kendriya Vidyalaya (Embassy of India School) Moscow**

**SPLIT-UP SYLLABUS 2024-25**

**SUBJECT: PHYSICS CLASS :XI**

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| **S .No** | **Month** | **No. of working Days** | **Description (Title of the chapter, Topics /Units)** | **Suggestive Practical, Project, MDP, Tests & Assignments** | **Suggested methodology to be used (Like PBL/AIL/CCT/ Experiential learning)** |
| **1** | APRIL | 22 | **Tarunotsava-Mathematical tools and basic concepts which are useful for studying Physics** |  | Mathematical Skills  CCT based Teaching |
| **2** | MAY | 19 | **Chapter–2: Units and Measurements**  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.  **Chapter–3: Motion in a Straight Line**  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).  **Chapter–4: Motion in a Plane**  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. | **Experiment 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.  Allotment of Investigatory  **Activity 1.**  To make a paper scale of given least count, e.g., 0.2cm, 0.5 cm.  **Project**  **Class Test** | CCT based Teaching  Experiential Learning |
| **3** | JUN & JUL | 21 | **Chapter–5: Laws of Motion**  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.  Equilibrium of concurrent forces, Static and kinetic friction, laws of friction, rolling friction, lubrication.  Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on a level circular road, vehicle on a banked road).  **Chapter–6: Work, Energy and Power**  Work done by a constant force and a variable force; kinetic energy, work energy theorem, power.  Notion of potential energy, potential energy of a spring, conservative forces: non-conservative forces, motion in a vertical circle; elastic and inelastic collisions in one and two dimensions. | **Experiment-2**  To measure diameter of a given wire and thickness of a given sheet using screw gauge.  **Experiment-3**  To determine volume of an irregular lamina using screw gauge.  **Activity-2**  To study the variation in range of a projectile with angle of projection. | CCT based Teaching  Experiential Learning |
| **4** | AUGUST | 19 | **Chapter–7: System of Particles and Rotational Motion**  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.  Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions. Moment of inertia, radius of gyration, values of moments of inertia for simple  Geometrical objects (no derivation).  **Chapter–8: Gravitation**  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 speed, orbital velocity of a satellite. | PT-1  **Experiment-4**  To determine radius of curvature of a given spherical surface by a spherometer.  **Activity 3.**  To observe change of state and plot a cooling curve for molten wax. | CCT based Teaching  Experiential Learning  AIL |
| **5** | SEPTEMBER | 21 | **Chapter–9: Mechanical Properties of Solids**  Elasticity, Stress-strain relationship, Hooke's law, Young’s modulus, bulk modulus, shear modulus of rigidity (qualitative idea only), Poisson's ratio; elastic energy.  **Chapter–10: Mechanical Properties of Fluids**  Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes), effect of gravity on fluid pressure.  Viscosity, Stokes' law, terminal velocity, streamline and turbulent flow, critical velocity, Bernoulli's theorem and its simple applications.  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. | **Experiment-5**  To find the force constant of a helical spring by plotting a graph between load and extension.  **Experiment-6**  To determine the coefficient of viscosity of a given viscous liquid by measuring  Terminal velocity of a given spherical body. | CCT based Teaching  Experiential Learning |
| **6** | OCTOBER | 19 | **Chapter–11: Thermal Properties of Matter**  Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv -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 .  **Chapter–12: Thermodynamics**  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. | Class Test  **Experiment-7**  To study the relationship between the temperature of a hot body and time by Plotting a cooling curve.  **Activity 4:**  To note the change in level of liquid in a container on heating and interpret the  Observations.  **Activity 5:**  To study the factors affecting the rate of loss of heat of a liquid. | CCT based Teaching  Experiential Learning |
| **7** | NOVEMBER | 21 | Revision | **Half-Yearly** |  |
| **8** | DEC & JAN | 21 | **Chapter–13: Kinetic Theory**  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.  **Chapter–14: Oscillations**  Periodic motion - time period, frequency, displacement as a function of time,periodic functions and their applications.  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. | **PT-2**  **Experiment-8**  To study the relation between frequency and length of a given wire under constant  Tension using sonometer.  **Activity 6:**  To study dissipation of energy of a simple pendulum by plotting a graph between square of amplitude and time. | CCT based Teaching  Experiential Learning |
| **9** | FEB 2025 | 20 | **Chapter–15: Waves**  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.  Revision-Preparing students for Session Ending Examination. | **Practical Exam** | CCT based Teaching  Experiential Learning |
| **10** | MARCH 2025 |  |  | **Session Ending Examination** |  |
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