

# TERM AND MONTH-WISE SPLIT UP SYLLABUS 2019-20

## SUBJECT: PHYSICS-XI

Month	Contents
JUNE	<p><b><u>Unit I: Physical World and Measurement</u></b>                      Physics - scope and excitement; nature of physical laws; Physics, technology and society. Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; Errors in measurements, significant figures. Dimensions of physical quantities, dimensional analysis and its applications.</p>
JULY	<p><b><u>Unit II: Kinematics</u></b>                      Frame of reference. Motion in a straight line: Position-time graph, speed and velocity. Uniform and non-uniform motion, speed and velocity - average and instantaneous Uniformly accelerated motion, velocity-time graph and position-time graph, equations for uniformly accelerated motion (graphical treatment only). Simple introduction to elementary concepts of differentiation and integration for describing motion. Scalar and vector quantities: vectors, notation, equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors. Position and displacement vectors, relative velocity. 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.</p>
Aug	<p><b><u>Unit III: Laws of Motion</u></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. Equilibrium of concurrent forces. Static and kinetic friction, laws of friction, rolling friction. Uniform circular motion. Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on level circular road, vehicle on banked road).</p>
<b>Revision of 1<sup>st</sup> SUMMATIVE EXAMINATION</b>	
September	<p><b><u>Unit IV: Work, Energy and Power</u></b>                      Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power. Notion Potential energy, potential energy of a spring, conservative forces: conservation of mechanical energy (kinetic and potential energies); non-conservative forces: Motion in a vertical circle, elastic collisions and elementary idea of inelastic collisions (in one and two dimensions)  <b><u>Unit V: Motion of System of Particles and Rigid Body</u></b>                      Centre of mass of a two-particle system, Centre of mass of rigid body. Centre of mass of uniform rod. Momentum conservation and centre of mass motion. Vector product of vectors; moment of a force, torque, angular momentum, conservation of angular momentum with some examples. 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). Statement of parallel and perpendicular axes theorem and their applications.</p>
October	<p><b><u>Unit VI: Gravitation:</u></b>                      Kepler's Laws of planetary motion. The universal law of gravitation; Acceleration due to gravity and its variation with altitude and depth. Gravitational potential energy; gravitational potential; Escape velocity, orbital velocity of a satellite, Geostationary satellites.</p>
November	<p><b><u>Unit VII: Properties of Bulk Matter :</u></b>                      Elastic behaviour, stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity. Poisson's ratio, elastic energy.                      Pressure due to fluid column, Pascal's law and its applications (hydraulic lift and hydraulic brakes), Effects of gravity on fluid pressure, Viscosity, Stoke's Law, Terminal Velocity, Reynold's number, Streamline and turbulent flow, critical velocity, Bernoulli's theorem and its applications.                      Surface energy and surface tension, angle of contact, excess of pressure, application of surface tension, ideas to drops, bubbles and Capillary rise.                      Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion, specific heat capacity; Cp &amp; Cv, calorimetry; change of state, Latent heat capacity.</p>
December	<p>Heat transfer : Conduction, convection and radiation; qualitative ideas of black body radiation, green house effect, thermal conductivity, Newton's law of cooling. Wein's displacement law, Stefan's law.  <b><u>Unit - VIII: Thermodynamics</u></b>                      Thermal equilibrium and definition of temperature (zeroth law of thermodynamics), Heat, work and internal energy; First law of thermodynamics, isothermal and adiabatic processes, Second Law of thermodynamics. Reversible and irreversible processes. Heat engines and refrigerators.  <b><u>Unit- IX: Behaviour of Perfect Gas and Kinetic Theory:</u></b>                      Equation of state of a perfect gas, work done on compressing a gas.                      Kinetic theory of gases - assumptions, concept of pressure, kinetic energy and temperature, rms speed of gas molecules, degrees of freedom, law of equipartition of energy (statement only) and application of specific heat capacities of gases, concept of mean free path. Avogadro's number.</p>
January	<p><b><u>Unit- X : Oscillations and Mechanical Waves:</u></b>                      Periodic motion - period &amp; frequency, displacement as a function of time and periodic functions, Simple harmonic motion (SHM) and its equation Phase, Oscillation of a spring restoring force and force constant; Energy in S.H.M (Kinetic and potential energies); Simple pendulum - derivation of expression for its time period; Free and forced and damped oscillations (qualitative ideas only), Resonance. Wave motion, Longitudinal and transverse waves, speed of wave motion. Displacement relation for a progressive wave, principle of superposition of waves.                      Reflection of waves, standing waves in string and organ pipes, fundamental mode and harmonics. Beats, Doppler effect .</p>
February	<p><b><u>Ray Optics:</u></b> Reflection of light, spherical mirrors, mirror formula, refraction of light, total internal reflection and its applications, optical fibres, refraction at spherical surfaces, lenses, thin lens formula, lensmaker's formula, magnification, power of a lens, combination of thin lenses in contact, refraction and dispersion of light through a prism. Scattering of light - blue colour of sky and reddish appearance of the sun at sunrise and sunset. Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.</p>
<b>Revision and Annual Examination</b>	

## **Term Wise Syllabus (For Examination)**

1 <sup>st</sup> Unit Test Syllabus (40 Marks, 1½ Hrs)	:	1. Physical World and Measurement. 2. Kinematics(Motion in a straight line)
1 <sup>st</sup> Term Exam (70 Marks, 3 Hrs)	:	1. Physical World and Measurement. 2. Kinematics(Motion in a straight line) 3. Laws of motion.
2 <sup>nd</sup> Unit test Syllabus (40 Marks, 1½ Hrs)	:	1. Motion of system of particles and Rigid body. 2. Gravitation.
Annual Examination (70 Marks, 3 Hrs)	:	Whole syllabus as per CBSE Board

Note : Syllabus is subjected to change as per CBSE