# D.A.V. Public School Sector – 3 Dhurwa Ranchi – 4

Class XI PHYSICS Syllabus (2020-2021)

#### Prescribed Books:

- > Physics For Class XI (NCERT)
- ➤ Laboratory Manual Physics Class Class XI

Months	Unit / Chapters	Sub Topics	Exam / Tests Portion
June	Unit I: Physical World and Measurement	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.	
		Monthly Test - Unit I (30 Marks)	
July	Unit II: Kinematics	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.	
		Monthly Test — Unit II ( 30 Marks)	

August	August  Intuitive concept of force. Inertia, Newton's first motion; momentum and Newton's second law of rimpulse; Newton's third law of motion. L conservation of linear momentum and its applic Equilibrium of concurrent forces. Static and friction, laws of friction, rolling friction. Uniform motion. Dynamics of uniform circular motion: Cen force, examples of circular motion (vehicle or circular road, vehicle on banked road).  Unit IV: Work, Energy and Power  Intuitive concept of force. Inertia, Newton's first motion; work and Newton's second law of rimpulse; Newton's second law of rimpulse; Newton's second law of rimpulse; Newton's third law of motion. L conservation of linear momentum and Newton's second law of rimpulse; Newton's third law of motion. L conservation of linear momentum and its application. Uniform motion. Dynamics of uniform circular motion: Cen force, examples of circular motion (vehicle or circular road, vehicle on banked road).  Work done by a constant force and a variable kinetic energy, work-energy theorem, power.		
		Monthly Test – Unit III & Unit IV Some Portion(30 Marks)	
			Half Yearly Exam Portion
September	Unit IV: Work, Energy and Power	Notion Potential energy, potential energy of a spring, conservative forces: conservation of mechanical energy (kinetic and potential energies); nonconservative forces: Motion in a vertical circle, elastic collisions and elementary idea of inelastic collisions (in one and twodimensions)	PT I Portion
		Revision for PT I	
		Monthly Test - Unit IV(30 Marks)	
October	Term- II  Unit V: Motion of System of Particles and Rigid Body	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 (cont.)	
		Monthly Test – Some portion Unit V (30 Marks)	
November	Unit V: Motion of System of Particles and Rigid Body	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.	
	Unit VI: Gravitation:	Keplar'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.  Monthly Test – Unit VI (30 Marks)  Elastic behaviour, stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear	PT II Portion
December	Unit VII: Properties of Bulk Matter:	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 & Cv, calorimetry; change of state, Latent heat capacity. 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.	
	<u>Unit — VIII: Thermodynamics</u>	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.  Revision for PT II	
		Monthly Test — Unit VII & VIII ( 30 Marks)	

	Unit- IX: Behaviour of Perfect Gas and Kinetic Theory:	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.	
January	Unit- X : Oscillations and Waves:	Periodic motion - period & 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.	
		Monthly Test — Unit IX & X (30 Marks)	
February	X Ray Optics		PT III Portion
		Revision for PT III & Final / Annual Term	Final / Annual Term Portion

## **SYLLABAS HALF YEARLY EXAMINATION -2019**

Class: XI Physics

Time: 3 Hrs. Max. Marks: 70

### I. Weightage to content/subject units:

Unit No.	Title	Marks
Unit I	Physical World & Measurement	15
Unit II	Kinematics	20
Unit III	Laws of Motion	20
Unit IV	Work, Energy & Power	15
	Total	70

Time: 3 Hrs Max. Marks: 70

### II. SYLLABAS ANNUAL EXAMINATION- 2020

Unit No.	Title	Marks
Unit I	Physical World & Measurement	15
Unit II	Kinematics	20
Unit III	Laws of Motion	20
Unit IV	Work, Energy & Power	15
	Total	70

### III. Weightage to form of Questions:

S.No.	Form of Questions	Marks for each guestion	No. of questions	Total Marks
		question		
1.	Long Answer Type (LA)	5	03	15
2.	Value Based Question	4	01	04
3.	Short Answer (SA I)	3	12	36
4.	Short Answer (SA II)	2	05	10
5.	Very Short Answer (VSA)	1	05	05
	Total		26	70