CBSE Class 11 Physics Updated Syllabus

CBSE Class 11 Physics Syllabus Course Structure

The table below shows the course structure and marks distribution in the updated Physics Class 11 Syllabus.

Unit	Chapters	No. of Periods	Marks
Physical World and Measurement	1: Units and Measurements	8	23
Kinematics	2: Motion in a Straight Line 3: Motion in a Plane	24	
Laws of Motion	4: Laws of Motion	14	17
Work, Energy, and Power	5: Work, Energy, and Power	14	
Motion of System of Particles and Rigid Body	6: System of Particles and Rotational Motion	18	
Gravitation	7: Gravitation	12	
Properties of Bulk Matter	8: Mechanical Properties of Solids 9: Mechanical Properties of Fluids 10: Thermal Properties of Matter	24	20
Thermodynamics	11: Thermodynamics	12	
Behaviour of Perfect Gases and Kinetic Theory of Gases	12: Kinetic Theory	8	

Oscillations and Waves	13: Oscillations 14: Waves	26	10
Total		160	70

Quick Overview of Physics Class 11 Syllabus

The Physics Class 11 Syllabus provides interesting chapters and topics. It starts with the basics and later into complex concepts. Check out the table below for a breakdown of what you'll be learning in each unit.

Physics Class 11 Syllabus (Chapter Wise)		
Unit	**Name**	**Description**
1	Physical World and Measurement	**Chapter–1: 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.

2	Kinematics	**Chapter–2: Motion in a Straight Line** The frame of reference, Motion in a straight line, Elementary concepts of differentiation and integration for describing motion, uniform and nonuniform motion, instantaneous velocity, uniformly accelerated motion, velocity-time, and position-time graphs. Relations for uniformly accelerated motion (graphical treatment). **Chapter–3: 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, and uniform circular motion.
3	Laws of Motion	**Chapter–4: 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).
4	Work, Energy, and Power	**Chapter–5: Work, Energy and Power** Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power. The notion of potential energy, the potential energy of a spring, conservative forces: non-conservative forces, motion in a vertical circle; elastic and inelastic collisions in one and two dimensions.
5	The motion of the System of Particles and Rigid Body	**Chapter–6: 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).

6	Gravitation	**Chapter–7: Gravitation** 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 and gravitational potential, escape speed, orbital velocity of a satellite.
7	Properties of Bulk Matter	**Chapter–8: 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 9: Mechanical Properties of Fluids** Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes), the effect of gravity on fluid pressure. Viscosity, Stokes' law, terminal velocity, streamlined 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. **Chapter 10: 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, and Stefan's law.
8	Thermodynamics	**Chapter–11: Thermodynamics** Thermal equilibrium and definition of temperature, zeroth law of thermodynamics, heat, work, and internal energy. The first law of thermodynamics, The second law of thermodynamics: gaseous state of matter, change of condition of gaseous state -isothermal, adiabatic, reversible, irreversible, and cyclic processes.
9	Behaviour of Perfect Gases and Kinetic Theory of Gases	**Chapter–12: Kinetic Theory** Equation of state of a perfect gas, work done in compressing a gas. Kinetic theory of gases – assumptions, the concept of pressure. Kinetic interpretation of temperature; rms speed of gas molecules; degrees of freedom; law of equipartition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.

10	Oscillations and Waves	**Chapter–13: Oscillations** Periodic motion – 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 period. **Chapter–14: 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.

Class 11 Physics Practical Syllabus

The record, to be submitted by the students, at the time of their annual examination, has to include:
• Record at least 8 Experiments [with 4 from each section], to be performed by the students.
• Record at least 6 Activities [with 3 each from section A and section B], to be performed by the students.
• Report on the project carried out by the students.

Practical Evaluation Scheme

Component	Description	Marks
Topic Marks	Performance on two experiments (one from each section of the syllabus).	7 + 7

Practical Record	Documentation of experiments, activities (observations, calculations, graphs), and project work.	5
Activity	Demonstration of a practical skill from any section of the syllabus.	3
Investigatory Project	Independent project showcasing understanding and application of Physics concepts.	3
Viva	Oral examination of performed experiments, activities, and the project.	5
Total		30

Experiments

Section A

Class 11 Physics Practical Syllabus Experiments
1. To measure the diameter of a small spherical/cylindrical body and to measure the internal diameter and depth of a given beaker/calorimeter using Vernier Callipers and hence find its volume.
2. To measure the diameter of a given wire and thickness of a given sheet using a screw gauge.
3. To determine the volume of an irregular lamina using a screw gauge.
4. To determine the radius of curvature of a given spherical surface by a spherometer.
5. To determine the mass of two different objects using a beam balance.
6. To find the weight of a given body using the parallelogram law of vectors.

7. Using a simple pendulum, plot its L-T2 graph and use it to find the effective length of the second pendulum.
8. To study the variation of a period of a simple pendulum of a given length by taking bobs of the same size but different masses and interpreting the result.
9. To study the relationship between the force of limiting friction and normal reaction and to find the coefficient of friction between a block and a horizontal surface.
10. To find the downward force, along an inclined plane, acting on a roller due to the gravitational pull of the earth, and study its relationship with the angle of inclination θ by plotting a graph between force and Sinθ.

Activities

Class 11 Physics Practical Syllabus Activities
1. To make a paper scale of given least count, e.g., 0.2cm, 0.5 cm.
2. To determine the mass of a given body using a metre scale by the principle of moments.
3. To plot a graph for a given set of data, with proper choice of scales and error bars.
4. To measure the force of limiting friction for rolling a roller on a horizontal plane.
5. To study the variation in the range of a projectile with an angle of projection.
6. To study the conservation of energy of a ball rolling down on an inclined plane (using a double inclined plane).

7. To study the dissipation of energy of a simple pendulum by plotting a graph between the square of amplitude and time.

Section B

Class 11 Physics Practical Syllabus Experiments
1. To determine Young's modulus of elasticity of the material of a given wire
2. To find the force constant of a helical spring by plotting a graph between load and extension.
3. 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 1/V.
4. To determine the surface tension of water by capillary rise method.
5. To determine the coefficient of viscosity of a given viscous liquid by measuring the terminal velocity of a given spherical body.
6. To study the relationship between the temperature of a hot body and time by plotting a cooling curve.
7. To determine the specific heat capacity of a given solid by the method of mixtures.
8. Study the relation between the frequency and length of a given wire under constant tension using a sonometer.
9. To study the relation between the length of a given wire and tension for constant frequency using a sonometer.
10. To find the speed of sound in air at room temperature using a resonance tube by two resonance positions.

Activities

Class 11 Physics Practical Syllabus Activities
1. To observe the change of state and plot a cooling curve for molten wax.
2. To observe and explain the effect of heating on a bi-metallic strip.
3. To note the change in the level of liquid in a container on heating and interpret the observations.
4. To study the effect of detergent on the surface tension of water by observing capillary rise.
5. To study the factors affecting the rate of loss of heat of a liquid.
6. To study the effect of load on depression of a suitably clamped metre scale loaded at (i) its end and (ii) in the middle.
7. To observe the decrease in pressure with an increase in the velocity of a fluid.

Prescribed Books for Class XI Physics:

1. Physics Part-I, Textbook for Class XI, Published by NCERT
2. Physics Part-II, Textbook for Class XI, Published by NCERT
3. Laboratory Manual of Physics, Class XI Published by NCERT
4. The list of other related books and manuals brought out by NCERT (consider multimedia also).