CBSE Class 12 Physics Updated Syllabus

Physics Syllabus Class 12 CBSE Course Structure

The table below shows the course structure and marks distribution in the updated CBSE Class 12 Physics Syllabus.

Unit	No. of Periods	Marks	Chapters
I: Electrostatics	26	16	1. Electric Charges and Fields 2. Electrostatic Potential and Capacitance
II: Current Electricity	18		3. Current Electricity
III: Magnetic Effects of Current and Magnetism	25	17	4. Moving Charges and Magnetism 5. Magnetism and Matter
IV: Electromagnetic Induction and Alternating Currents	24		6. Electromagnetic Induction 7. Alternating Current
V: Electromagnetic Waves	4	18	8. Electromagnetic Waves
VI: Optics	30		9. Ray Optics and Optical Instruments 10. Wave Optics
VII: Dual Nature of Radiation and Matter	8	12	11. Dual Nature of Radiation and Matter
VIII: Atoms and Nuclei	15		12. Atoms 13. Nuclei
IX: Electronic Devices	10	7	14.SemiconductorElectronics: Materials, Devices and Simple Circuits
Total	160	70	

Quick Overview of Physics Syllabus Class 12 CBSE

The Physics Syllabus Class 12 CBSE provides interesting chapters and topics. It starts with the basics of Physics and later into complex concepts. Check out the description below for your learning in each unit.

Unit I- Electrostatics

Chapter–1: Electric Charges and Fields

Electric charges, Conservation of charge, Coulomb's law force between two point charges, forces between multiple charges; superposition principle, and continuous charge distribution. Electric field, electric field due to a point charge, electric field lines, electric dipole, electric field due to a dipole, torque on a dipole in a uniform electric field.
Electric flux, statement of Gauss's theorem and its applications to find field due to infinitely long straight wire, uniformly charged infinite plane sheet, and uniformly charged thin spherical shell (field inside and outside).

Chapter–2: Electrostatic Potential and Capacitance

Electric potential, potential difference, electric potential due to a point charge, a dipole, and system of charges; equipotential surfaces, the electrical potential energy of a system of two point charges, and electric dipole in an electrostatic field.
Conductors and insulators, free charges, and bound charges inside a conductor. Dielectrics and electric polarisation, capacitors, and capacitance, a combination of capacitors in series and parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor (no derivation, formulae only).

Unit II- Current Electricity

Chapter–3: Current Electricity

Electric current, the flow of electric charges in a metallic conductor, drift velocity, mobility and their relation with electric current; Ohm's law, V-I characteristics (linear and nonlinear), electrical energy and power, electrical resistivity, and conductivity, temperature dependence of resistance, Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and parallel, Kirchhoff's rules, Wheatstone bridge.

Unit III- Magnetic Effects of Current and Magnetism

Chapter–4: Moving Charges and Magnetism

Concept of the magnetic field, Oersted's experiment.
Biot - Savart law and its application to the current carrying circular loop.
Ampere's law and its applications to infinitely long straight wire. Straight solenoid (only qualitative treatment), force on a moving charge in uniform magnetic and electric fields. Force on a current-carrying conductor in a uniform magnetic field, the force between two parallel current-carrying definitions of an ampere, torque experienced by a current loop in a uniform magnetic field; Current loop as a magnetic dipole and its magnetic dipole moment, moving coil galvanometer current sensitivity and conversion to ammeter and voltmeter.

Chapter–5: Magnetism and Matter

Bar magnet, bar magnet as an equivalent solenoid (qualitative treatment only), magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis (qualitative treatment only), torque on a magnetic dipole (bar magnet) in a uniform magnetic field (qualitative treatment only), magnetic field lines.
Magnetic properties of materials- Para-, dia- and ferromagnetic substances with examples, Magnetization of materials, the effect of temperature on magnetic properties.

Unit IV- Electromagnetic Induction and Alternating Currents

Chapter–6: Electromagnetic Induction

Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Self and mutual induction.

Chapter–7: Alternating Current

Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance; LCR series circuit (phasors only), resonance, power in AC circuits, power factor, attless current. AC generator, Transformer.

Unit V- Electromagnetic waves

Chapter–8: Electromagnetic Waves

The basic idea of displacement current, Electromagnetic waves, their characteristics, and their transverse nature (qualitative idea only).
Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.

Unit VI- Optics

Chapter–9: Ray Optics and Optical Instruments

Ray Optics: Reflection of light, spherical mirrors, mirror formula, refraction of light, total internal reflection and optical fibres, refraction at spherical surfaces, lenses, thin lens formula , lens maker's formula, magnification, power of a lens, combination of thin lenses in contact, refraction of light through a prism.
Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.

Chapter–10: Wave Optics

Wave Optics: Wavefront and Huygens principle, reflection, and refraction of plane waves at a plane surface using wave fronts. Proof of laws of reflection and refraction using Huygens principle. Interference, Young's double slit experiment and expression for fringe width (No derivation final expression only), coherent sources and sustained interference of light, diffraction due to a single slit, width of central maxima (qualitative treatment only).

Unit VII- Dual Nature of Radiation and Matter

Chapter 11: Dual Nature of Radiation and Matter

Dual nature of radiation, Photoelectric effect, Hertz and Lenard's observations; Einstein's photoelectric equation- particle nature of light. Experimental study of photoelectric effect Matter waves-wave nature of particles, de-Broglie relation.

Unit VIII- Atoms and Nuclei

Chapter–12: Atoms

Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model of the hydrogen atom, Expression for the radius of the nth possible orbit, velocity, and energy of an electron in his orbit, of hydrogen line spectra (qualitative treatment only).

Chapter–13: Nuclei

Composition and size of nucleus, nuclear force Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number; nuclear fission, nuclear fusion.

Unit IX- Electronic Devices

Chapter–14: Semiconductor Electronics: Materials, Devices and Simple Circuits

Energy bands in conductors, semiconductors, and insulators (qualitative ideas only) Intrinsic and extrinsic semiconductors- p and n-type, p-n junction Semiconductor diode - I-V characteristics in forward and reverse bias, application of junction diode -diode as a rectifier.

CBSE Class 12 Physics Practical Evaluation Scheme:

CBSE Class 12 Physics Syllabus	
Two experiments one from each section	7+7 Marks
Practical record experiments and activities	5 Marks

One activity from any section	3 Marks
Investigatory Project	3 Marks
Viva on experiments, activities, and project	5 Marks
Total	**30 marks**

CBSE Syllabus for Class 12 Physics Practical

List of Experiments for Class 12 Physics Practical: Section A

- To determine the resistivity of two / three wires by plotting a graph for potential difference versus current.
- To find the resistance of a given wire / standard resistor using a metre bridge.
- To verify the laws of combination (series) of resistances using a metre bridge

OR

- To verify the laws of combination (parallel) of resistances using a metre brid
- To determine the resistance of a galvanometer by the half-deflection method and to find its figure of merit.
- To convert the given galvanometer (of known resistance and figure of merit) into a voltmeter of the desired range and to verify the same.

OR

- To convert the given galvanometer (of known resistance and figure of merit) into an ammeter of the desired range and to verify the same.
- To find the frequency of AC mains with a sonometer.

Activities

1. To measure the resistance and impedance of an inductor with or without an iron core.

2. To measure resistance, voltage (AC/DC), and current (AC) and check the continuity of a given circuit using a multimeter.

3. To assemble a household circuit comprising three bulbs, three (on/off) switches, a fuse, and a power source.

4. To assemble the components of a given electrical circuit.

5. To study the variation in potential drop with the length of a wire for a steady current.

6. To draw the diagram of a given open circuit comprising at least a battery, resistor/rheostat, key, ammeter, and voltmeter. Mark the components that are not connected in proper order and correct the circuit and also the circuit diagram.

List of Experiments for Class 12 Physics Practical: Section B

- To find the value of v for different values of u in the case of a concave mirror and to find the focal length.
- To find the focal length of a convex mirror, using a convex lens.
- To find the focal length of a convex lens by plotting graphs between u and v or between 1/u and 1/v.
- To find the focal length of a concave lens, use a convex lens.
- To determine the angle of minimum deviation for a given prism by plotting a graph between the angle of incidence and the angle of deviation.
- To determine the refractive index of a glass slab using a travelling microscope.
- To find the refractive index of a liquid using a convex lens and plane mirror.
- To find the refractive index of a liquid using a concave mirror and a plane mirror.
- To draw the I-V characteristic curve for a p-n junction diode in forward and reverse bias.

Activities Assigned

- To distinguish a diode, an LED, a resistor, and a capacitor from a group of such components.

- Use a multimeter to observe the unidirectional flow of current in the case of a diode and an LED, and to determine if a certain electrical component (e.g., diode) is operational.
- To investigate the effect of light intensity (as measured by increasing the distance from the source) on an LDR.
- To investigate the refraction and lateral deviation of a light beam incident obliquely on a glass slab.
- To examine light diffraction caused by a narrow slit.
- To study the type and size of the image created by a (i) convex lens and (ii) concave mirror on a screen using a candle and a screen (at various distances from the lens/mirror).
- Using two lenses from the supplied collection of lenses, create a lens combination with the required focal length.

CBSE Physics Class 12 Syllabus - Question Paper Design

The Central Board of Secondary Education (CBSE) has released the question paper design for the upcoming academic year Physics exam for Class 12. This breakdown outlines the format and types of questions you can expect for the test.

S No.	Typology of Questions	Total Marks	Approximate Percentage
1	**Remembering & Understanding** Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers. Demonstrate understanding of facts and ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas	27	38%
2	**Applying** Solve problems in new situations by applying acquired knowledge, facts, techniques, and rules in a different way.	22	32%
3	**Analysing & Evaluating** Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations.	21	30%

	Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria. **Creating**: Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions		
Total	Theory	70	100%
	Practical	30	
Gross Total		100	

Prescribed Books for Physics Class 12:

1. Physics, Class XII, Part -I and II, Published by NCERT.

2. Laboratory Manual of Physics for class XII Published by NCERT.

3. The list of other related books and manuals brought out by NCERT (consider multimedia also).