

SYLLABUS BREAK -UP [PHYSICS]

CLASS: XII [SESSION 2026-27]

BOOK: PHYSICS [NCERT]

S.N	CHAPTER	SUB TOPICS	PERIODS
	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	5
		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 uniform electric field	5
		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).	3
	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, electrical potential energy of a system of two-point charges and of electric dipole in an electrostatic field	4
		Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarization, capacitors and capacitance, combination of capacitors in series and in parallel, capacitance of a parallel plate capacitor with and without dielectric medium between the plates, energy stored in a capacitor (no derivation, formulae only).	6
	Unit II: Current Electricity Chapter–3: Current Electricity	Electric current, 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 non-linear), electrical energy and power, electrical resistivity and conductivity, temperature dependence of resistance	5
		Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel, Kirchoff's rules, Wheatstone bridge.	5
	Unit III: Magnetic Effects of Current and Magnetism Chapter–4: Moving Charges and Magnetism	Concept of magnetic field, Oersted's experiment. Biot - Savart law and its application to current carrying circular loop. Ampere's law and its applications to infinitely long straight wire. Straight solenoid (only qualitative treatment),	5
		force on a moving charge in uniform magnetic and electric fields. Force on a	4

	current-carrying conductor in a uniform magnetic field, force between two parallel current-carrying conductors-definition of ampere	
	torque experienced by a current loop in uniform magnetic field; Current loop as a magnetic dipole and its magnetic dipole moment, moving coil galvanometer- its current sensitivity and conversion to ammeter and voltmeter	3
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	3
	Magnetic properties of materials- Para-, dia- and ferro – magnetic substances with examples, Magnetization of materials, effect of temperature on magnetic properties	2
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.	4
Chapter–7: Alternating Current	Alternating currents, peak and RMS value of alternating current/voltage; reactance and impedance;	3
	LCR series circuit (phasors only), resonance, power in AC circuits, power factor, wattless current. AC generator, Transformer.	3
Unit V: Electromagnetic waves Chapter–8: Electromagnetic Waves	Basic idea of displacement current, Electromagnetic waves, their characteristics, their transverse nature (qualitative idea only).	2
	Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.	1
Unit VI: Optics Chapter–9: Ray Optics and Optical Instruments	Ray Optics: Reflection of light, spherical mirrors, mirror formula	3
	Refraction of light, total internal reflection and optical fibers	3
	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	3
	Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.	4

Chapter–10: Wave Optics	Wave optics: Wave front and Huygen’s principle, reflection and refraction of plane wave at a plane surface using wave fronts. Proof of laws of reflection and refraction using Huygen’s principle	3
	Interference, Young's double slit experiment and expression for fringe width (No derivation final expression only), coherent sources and sustained interference of light,	3
	diffraction due to a single slit, width of central maxima (qualitative treatment only).	3
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.	3
	Experimental study of photoelectric effect	2
	Matter waves-wave nature of particles, de-Broglie relation.	2
Unit VIII: Atoms and Nuclei Chapter–12: Atoms	Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model of hydrogen atom,	2
	Expression for radius of nth possible orbit, velocity and energy of electron in nth orbit, hydrogen line spectra (qualitative treatment only).	2
Chapter–13: Nuclei	Composition and size of nucleus, nuclear force	2
	Mass-energy relation, mass defect; binding energy per nucleon and its variation with mass number;	3
	nuclear fission, nuclear fusion	2
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	3
	Semiconductor diode - I-V characteristics in forward and reverse bias	3
	application of junction diode -diode as a rectifier.	2
EXTRA CLASSES MAY BE CONDUCTED AS PER REQUIREMENT.		

Cycle Test I – May 2026 Reflection of light, Refraction of light , Electrostatics (till continuous charge distribution)

Cycle test II- July 2026 Ray optics, Wave optics, Electric charges and fields

Pre-Board Examination (complete syllabus) November and December 2026.

EXPERIMENTS

SECTION-A

1. To determine resistivity of a given wire by plotting a graph for potential difference versus current.
2. To determine values of unknown resistance using meter bridge.
3. To verify the laws of combination (series) of resistances using a metre bridge.
4. To determine the resistance of a galvanometer by half deflection method.
5. To find the frequency of AC mains with a sonometer.

SECTION-B

1. To find the focal length of a convex lens by plotting graphs between u and v .
2. To determine the focal length of a convex mirror using convex lens.
3. To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.
4. To find refractive index of a liquid by using convex lens and plane mirror.
5. To draw the I-V characteristic curve for a p-n junction in forward bias and reverse bias.

ACTIVITIES

1. To assemble a household circuit comprising three bulbs, three (on/off) switches, a fuse and a power source.
2. To assemble the components of a given electrical circuit
3. 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.
4. To identify a diode, an LED, a resistor and a capacitor from a mixed collection of such items.
5. To observe diffraction of light due to a thin slit.
6. To observe refraction and lateral deviation of a beam of light incident obliquely on a glass slab.