

AIR FORCE SCHOOL BAMRAULI  
SPLIT - UP SYLLABUS  
ACADEMIC SESSION - 2024 - 25

CLASS : XII

SUBJECT: PHYSICS

BOOK NAME: NCERT

MONTH	CHAPTER NO. & CHAPTER NAME	TOPIC/SUB TOPIC	NO. OF PERIODS	ACTIVITY
APRIL	1. ELECTRIC CHARGE 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 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)	16	Experiment -01: To determine resistivity of the given wire by plotting a graph for potential versus current.
MAY	2. ELECTROSTATIC POTENTIAL AND CAPACITANCE	Electric potential, potential difference, electric potential due to a point charge, a dipole and system of charge; equipotential surfaces, electrical potential energy of a system of two-point charges and of electric dipole in an electrostatic field. 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)	10	Experiment -02: To find resistance of a given wire/standard resistor using metre bridge.
JUNE	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, internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and parallel, Kirchhoff's rules, Wheatstone bridge.	18	Experiment -03: To verify the laws of combination (series/parallel) of resistances using a metre bridge.
JULY	4. MOVING CHARGE AND MAGNETISM	Concept of magnetic field, Oersted's experiment. Biot - Savart law and its application to current carrying 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, 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.	18	Experiment -04: To determine resistance of a galvanometer by half deflection method and to find its figure of merit. Experiment -05: To find the value of $v$ for different values of $u$ in case of a concave mirror and to find the focal length. Activity -01 : To assemble a household circuit comprising three bulbs, three (on/off) switches, a fuse and a power source.
	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 ferro- magnetic substances with examples, Magnetization of materials, effect of temperature on magnetic properties.	7	
AUG.	6. ELECTROMAGNETIC INDUCTION	Electromagnetic induction; Faraday's law, induced EMF and current; Lenz's Law, Self and mutual induction.	12	Experiment -06: To find the focal length of a convex mirror, using a convex lens. Activity -02: To assemble the components of a given electrical circuit.
	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, wattless current. AC generator, Transformer.	12	Activity -03: To study the variation in potential drop with length of a wire for a steady current.
	8. ELECTROMAGNETIC WAVES	Basic idea of displacement current, Electromagnetic waves, their characteristics, their transverse nature ( qualitative idea only). Electromagnetic spectrum (radio waves, microwaves, infrared, visible, ultraviolet, X-rays, gamma rays) including elementary facts about their uses.	4	
SEPT.	9. RAY OPTICS AND OPTICAL INSTRUMENTS	Reflection of light, spherical mirrors, mirror formula, refraction of light, total internal reflection and optical fibers, 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.	20	Experiment -07: To find the focal length of a convex lens by plotting graph between $u$ and $v$ or between $1/u$ and $1/v$ . Activity -04: To identify a diode, an LED, a resistor and a capacitor from a mixed collection of such items.
	10. 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. 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)	10	
OCT.	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. Matter waves-wave nature of particle, de- Broglie relation.	8	Experiment -08: To determine angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation.
	12. ATOMS	Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model of hydrogen atom, Expression for radius of $n$ th possible orbit, velocity and energy of electron in $n$ th orbit, hydrogen line spectra (qualitative treatment only)	8	Experiment -09: To draw the IV characteristic curve for a p-n junction diode in forward and reverse bias.
	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.	7	Activity -05: To observe refraction and lateral deviation of a beam of light incident obliquely on a glass slab. Activity -06: To study the nature and size of the image formed by a (i) convex lens, or (ii) concave mirror, on a screen by using a candle and a screen (for different distance of the candle from the lens/mirror)
	14. ELECTRONICS: MATERIAL, 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- IV characteristic in forward and reverse bias, application of junction diode- diode as a rectifier.	10	
NOV.		PRE-BOARD-01		
DEC.		PRE-BOARD-02		