

WBJEE Physics Syllabus

Topics	Sub-Topics
Physical World, Measurements, Units and Dimensions	Physical quantities, Units and dimensions, Dimensional analysis, Applications of dimensional analysis; Significant figures
Kinematics	Scalars and vectors, Representation of vectors in three dimensions, Dot and cross products, Applications of Elementary differential and integral calculus, Time-velocity graphs, Equations of motion, Uniformly accelerated
Laws of Motion	Newton's laws of motion, Applications using algebra and calculus, Inertial and non-inertial frames, Conservation of momentum, Elastic and inelastic collisions, Impulse, Centripetal force, Banking of roads, Relative velocity, Uniform circular motion
Work, Power and Energy	Work, Work-energy theorem, Power, Kinetic energy, Potential energy, Work done by constant forces, Work done by variable forces, Conservation of mechanical energy, Conservative and non-conservative forces, Potential energy of a spring
Centre of Mass, Rotational Motion and Friction	Centre of mass of a two-particle system, Motion of connected systems, Torque, Equilibrium of rigid bodies, Moment of inertia, Simple geometric bodies, Conservation of angular momentum, Friction, Laws of friction
Gravitation	Kepler's laws, Universal law of gravitation, Acceleration due to gravity, Variation of g, Gravitational potential, Gravitational potential energy, Escape velocity, Orbital velocity, Satellites, Geostationary orbits
Properties of Matter	Elasticity: Hooke's law, Young's modulus, Bulk modulus, Shear/rigidity modulus, Poisson's ratio, Elastic potential energy
	Fluids: Fluid pressure, Pressure due to a fluid column, Buoyancy, Pascal's law, Effect of gravity on fluids, Viscosity
	Surface Tension: Surface energy, Surface tension phenomena, Angle of contact, Capillary rise
	Viscosity: Coefficient of viscosity, Streamline and turbulent flow, Reynolds number, Stokes' law, Terminal velocity
Heat and Thermal Physics	Heat and temperature, Thermal expansion of solids, liquids and gases, Ideal gas laws, Isothermal and adiabatic processes, Anomalous expansion of water, Specific heat capacity, Calorimetry, Change of state, Latent heat, Heat conduction, Heat convection, Thermal conductivity, Convection, Radiation, Newton's law of cooling, Stefan's law
Thermodynamics	Thermal equilibrium, Zeroth law of thermodynamics, Heat, Work, Internal energy, First law of thermodynamics, Thermodynamic process, Adiabatic process, Second law of thermodynamics, Reversible and irreversible processes
Kinetic Theory of Gases	Equation of state of an ideal gas, Assumptions of kinetic theory, Molecular interpretation of pressure, Mean square speed, Degrees of freedom, Law of equipartition of energy, Specific heats of gases, Mean free path, Avogadro's number
Oscillations and Waves	Periodic motion, Time period, Frequency, Time-displacement equation, Simple harmonic motion, Phase difference, Energy in SHM, Kinetic and potential energy, Free, forced and damped oscillations, Resonance, Wave motion, Progressive waves, Longitudinal and transverse waves, Sound waves, Newton's correction, Velocity of sound in air, Superposition principle, Reflection of waves, Standing waves, String vibrations, Fundamental mode, Harmonics and overtones, Beats, Doppler effect
Electrostatics	Conservation of electric charge, Coulomb's law, Force between multiple charges, Superposition principle, Electric field, Electric field distribution, Electric field, Electric potential, Electric field lines, Electric dipole, Electric field due to a dipole, Gauss's theorem, Applications of Gauss' law, Conductors and insulators, Free and bound charges, Electric polarization, Capacitors, Capacitance, Series and parallel combination, Parallel-plate capacitor, Energy stored in a capacitor

Current Electricity	Electric current, Conductors, Drift velocity, Mobility, Ohm's law, Resistance, Ohmic and non-ohmic co and power, Carbon resistors, Resistor colour codes, Combination of resistances, Temperature depen EMF, Internal resistance, Potential difference, Combination of cells, Secondary cells, Kirchhoff's laws Metre bridge, Potentiometer, Thermoelectricity, Seebeck effect, Peltier effect, Thermo-emf
Magnetic Effects of Current	Magnetic field, Oersted's experiment, Biot-Savart law, Magnetic field due to circular current loop, Am conductor, Solenoids, Toroidal solenoids, Motion of charged particles in magnetic fields, Motion in ele Cyclotron frequency, Force on current-carrying conductor, Force between parallel current-carrying co current loop, Moving-coil galvanometer, Current sensitivity, Conversion of galvanometer into ammete extension of ammeter and voltmeter
Magnetism	Current loop as magnetic dipole, Magnetic dipole moment, Magnetic moment of revolving electron, M magnet, Axial and equatorial fields, Torque on magnetic dipole, Magnet as equivalent solenoid, Magn magnetic field, Magnetic elements of Earth, Diamagnetic substances, Paramagnetic substances, Fer Electromagnets, Factors affecting electromagnet strength, Permanent magnets
Electromagnetic Induction and Alternating Current	Electromagnetic induction, Faraday's laws, Induced EMF, Induced current, Lenz's law, Eddy currents induction, Alternating current, Peak and RMS values, AC voltage, Reactance, Impedance, LR circuits difference, LCR series circuit, Resonance, Power in AC circuits, Wattless current
Electromagnetic Waves	Electromagnetic waves, Characteristics, Transverse nature, Electromagnetic spectrum, Applications i spectrum
Optics – Ray Optics	Reflection, Spherical mirrors, Mirror formula, Refraction, Total internal reflection, Optical fibres, Refra Lenses, Thin lens formula, Lens maker's formula, Newton's relation, Displacement method, Conjugat Power of lens, Combination of thin lenses, Combination of lens and mirror, Prism, Dispersion, Optica Accommodation, Myopia and hypermetropia, Correction of eye defects, Microscopes, Astronomical te power
Optics – Wave Optics	Scattering of light, Blue colour of sky, Elementary idea of Raman effect, Wavefront, Huygens' principl using wavefronts, Interference, Young's double-slit experiment, Fringe width, Coherent sources, Frau slit diffraction
Particle Nature of Light and Wave-Particle Dualism	Photoelectric effect, Hertz's observations, Lenard's observations, Einstein's photoelectric equation, P Matter waves, de Broglie relation, Wave nature of particles
Atomic Physics	Alpha-particle scattering, Rutherford's nuclear model, Bohr model, Energy levels, Hydrogen spectrun Characteristic X-rays
Nuclear Physics	Composition of nucleus, Nuclear size, Atomic masses, Isotopes, Isobars, Isotones, Radioactivity, Alpl radiation, Radioactive decay law, Mass-energy relation, Mass defect, Binding energy, Binding energy fission, Nuclear fusion
Solid-State Electronics	Energy bands, Conductors, Insulators, Semiconductors, Semiconductor diode, I-V characteristics, Fo Rectifiers, LED, Photodiode, Solar cell, Zener diode, Zener diode as voltage regulator, BJT, Transisto characteristics, BJT as amplifier, CE configuration, Transistor oscillator, Logic gates