BHARTIYA SHIKSHA BOARD
Tentative Syllabus – Physics
Class XI
Subject Code:158
Total Periods=204 (Theory 170 + Practical 34)

Units & Dimensions
Basic & derived quantities, New SI system of units, Dimensions, Error, uncertainty and error propagation, Significant figures

General Motion
Calculus method, Instantaneous speed, instantaneous acceleration, x-t, v-t, a-t graphical interpretation. Relative velocity

Laws of Motion
Equilibrium of a particle, Free body diagrams, Motion on a curved level road, Banking of roads

Work, Energy and Power
Work energy theorem, Conservative & Non-conservative forces, Hooke's law, Potential energy of a spring, Motion in a vertical circle. Collisions – elastic & inelastic, Kinetic theory – $1/3\ \rho v^2$

Centre of Mass
Centre of mass, Linear momentum of system of particles

Gravitation
Kepler's law, Universal law of Gravitation, acceleration due to gravity – variation with altitude and depth, Gravitational potential energy, escape speed

Thermodynamics
Modes of heat transfer – conduction, convection, radiation. Thermodynamic system. Thermodynamic variables. Thermodynamic equilibrium, Zeroth Law

Properties of Materials – Static
Surface tension. Elasticity

Waves
SHM, Simple pendulum. Periodic waves. Wave equation. Wave speed and factors affecting it. Reflection of waves, equation of reflected wave

Electrostatics
Introduction of electric charges, properties of electric charges. Coulomb's law and forces between multiple charges. Electric field, electric field lines, dipole field. Electrostatic potential and electrostatic potential energy

Current Electricity
Electric current, drift of electrons and the origin of resistivity in conducting materials (explanation of temperature dependence), current density, $J = \sigma E$, Ohmic and non-ohmic devices

Earth's Magnetic Field
Origin of Earth's magnetic field, variation with time and location. The magnetic elements

Moving Charges and Magnetism
Magnetic force on a moving charge and definition of magnetic field B. Motion of a charged particle in magnetic field. Force on a moving charged particle in combined electric and magnetic field, motion of a charged particle in mutually perpendicular electric and magnetic field. Force on current carrying conductor in a magnetic field. Magnetic field due to current element, Biot–Savart Law, magnetic field due to a straight wire and on the axis of a circular current loop, magnetic dipole and magnetic dipole moment. Forces between two parallel currents, Electric motor

Refraction at Curved Surfaces & Applications
Variation of refractive index with wavelength, Refraction through curved surfaces. Lenses, Power of a lens, Lens combinations. Human eye & defects. Microscope & Telescope

Nucleus
Nucleus, nuclear forces, Binding energy and nuclear stability, mass–energy equivalence. Energy bands in solids – Cu, Si, diamond

Basics of Semiconductors
Elemental semiconductor, Doping and types of semiconductors, Conduction in semiconductors

Laser in LASIK and Metal Cutting

Particle Accelerator for Ion Implantation – Semiconductor Doping