

CLASS- XI - PHYSICS

| MONTH | CHAPTER | EXPECTED LEARNING OUTCOMES | PEDAGOGICAL APPROACH (TEACHING METHODS/ STRATEGIES) | ASSESSMENT TOOLS | RUBRICS | ART INTEGRATION | ICT INTEGRATION |
|-------|---------------------------|---|--|--|----------------------------------|-----------------|-----------------|
| JULY | BASIC MATHEMATICAL TOOLS | Basic Calculus, binomial theorem, trigonometric relations | Constructivist, inquiry | assignment problem solving | Content Neatness completion | | |
| | UNIT AND MEASUREMENT | Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Significant figures. Dimensions of physical quantities, dimensional analysis and its applications. | Constructivist, reflective, inquiry | classroom discussion problem solving assignment experiment | Concept Presentation application | | |
| | MOTION IN A STRAIGHT LINE | Motion in a Straight Line- Frame of reference, Motion in a straight line..Elementary concepts of differentiation and integration for describing motion, uniform and non- | Constructivist, reflective, inquiry | Problem based classroom discussion | Concept Presentation Application | Draw Graphs | |

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| | | uniform motion, and instantaneous velocity, uniformly accelerated motion, velocity - time and position-time graphs. Relations for uniformly accelerated motion (graphical treatment). | | | | | |
| | PRE MID TERM EXAMINATION | | | | | | |
| AUGUST | MOTION IN A PLANE | Motion in a Plane Scalar and vector quantities; position and displacement vectors, general vectors and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors Unit vector; resolution of a vector in a plane, rectangular components, Scalar and Vector product of vectors. Motion in a plane, cases of uniform velocity and uniform acceleration, projectile motion, | Constructivist, reflective, inquiry based | Brain storming Problem based classroom discussion assignment | Content Neatness completion | | Module- projectile and circular motion |

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| | | uniform circular motion | | | | | |
| | LAWS OF MOTION | Intuitive concept of force, Inertia, Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion. Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces, Static and kinetic friction, laws of friction, rolling friction, lubrication. Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on a level circular road, vehicle on a banked road). | Constructivist, reflective, inquiry based | Brain storming Problem based classroom discussion assignment | Content Neatness completion | Share daily life examples of newtons three laws of Motion. | |
| SEPTEMBER | WORK ENERGY AND POWER | Work done by a constant force and a variable force; kinetic energy, work energy theorem, power. Notion of potential | Constructivist, reflective, Inquiry based | Brain storming classroom discussion problem solving | Concept Sequencing accuracy | Draw diagrams | |

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| | | energy, potential energy of a spring, conservative forces: non-conservative forces, motion in a vertical circle; elastic and inelastic collisions in one and two dimensions. | | | | |
| MOTION OF SYSTEM OF PARTICLES AND ROTATION | System of Particles and Rotational Motion Centre of mass of a two-particle system, momentum conservation and Centre of mass motion. Centre of mass of a rigid body; centre of mass of a uniform rod. Moment of a force, torque, angular momentum, law of conservation of angular momentum and its applications. Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions. Moment of inertia, radius of | Constructivist, reflective inquiry based | Brain storming classroom discussion problem solving | Concept Sequencing Accuracy | | Module-rigid bodies ,moment of inertia |

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| | | gyration, values of moments of inertia for simple geometrical objects (no derivation) | | | | | |
| OCTOBER | MID TERM EXAMINATION | | | | | | |
| | GRAVITATION | Gravitation, Newtons universal gravitational law, Kepler's laws, acceleration due to gravity and its variation with altitude and depth, gravitational field, potential and potential energy, escape velocity, orbital velocity, satellites, | Constructivist reflective, inquiry based | Brain storming classroom discussion problem solving experiment | Concept Presentation Application | | |
| | MECHANICAL PROPERTIES OF SOLIDS | Mechanical Properties of Solids: Elastic behaviour, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity, Poisson's ratio; elastic energy. | Constructivist reflective, inquiry | Brain storming classroom discussion problem solving | Concept Presentation Application | Draw diagrams | three modulus of elasticity |
| | MECHANICAL PROPERTIES OF FLUIDS | Mechanical Properties of Fluids: Pressure due to a fluid column; Pascal's law and its | Constructivist reflective, inquiry based | Brain storming classroom discussion | Concept Presentation Application | | Modules on hydrostatics and stream lined and turbulent flow |

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| | | <p>applications (hydraulic lift and hydraulic brakes), effect of gravity on fluid pressure. Viscosity, Stokes' law, terminal velocity, streamline and turbulent flow, critical velocity, Bernoulli's theorem and its applications. Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, application of surface tension ideas to drops, bubbles and capillary rise.</p> | | <p>problem solving</p> | | | |
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| NOVEMBER | OSCILLATION | <p>Periodic motion - time period, frequency, displacement as a function of time, periodic functions and their application. Simple harmonic motion (S.H.M) and its equations of motion; phase; oscillations of a loaded spring- restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum derivation of expression for its time period..</p> | Constructivist reflective, inquiry | <p>Brain storming classroom discussion</p> <p>problem solving experiment</p> | Concept Presentation Application | | |
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| | <p>WAVE MOTION</p> | <p>Transverse and longitudinal waves, speed of travelling wave, displacement relation for a progressive wave, principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, fundamental mode and harmonics, Beats.</p> | <p>Constructivist reflective, inquiry based</p> | <p>Brain storming classroom discussion problem solving</p> | <p>Concept Presentation Application</p> | | <p>Module on wave motion</p> |
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| DECEMBER | <p>THERMAL PROPERTIES OF MATTER</p> | <p>Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; C_p, C_v - calorimetry; change of state - latent heat capacity. Heat transfer- conduction, convection and radiation, thermal conductivity, qualitative ideas of Blackbody radiation, Wein's displacement Law, Stefan's law .</p> | <p>Constructivist, reflective, inquiry based</p> | <p>Brain storming classroom discussion problem solving assignment</p> | <p>content Neatness completion</p> | <p>Draw diagrams</p> | |
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| POST MID TERM EXAMINATION | | | | | | | |
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| JANURARY 25 | THERMODYNAMICS | Thermal equilibrium and definition of temperature zeroth law of thermodynamics, heat, work and internal energy. First law of thermodynamics, Second law of thermodynamics: gaseous state of matter, change of condition of gaseous state -isothermal, adiabatic, reversible, irreversible, and cyclic processes. . | Constructivist, reflective ,inquiry based | Brain storming classroom discussion problem solving assignment | content Neatness completion | | Video Carnot's cycle |

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| | <p>KINETIC THEORY</p> | <p>Equation of state of a perfect gas, work done in compressing a gas. Kinetic theory of gases - assumptions, concept of pressure. Kinetic interpretation of temperature; r.m.s speed of gas molecules; degrees of freedom, law of equipartition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.</p> | <p>Constructivist, reflective, inquiry based</p> | <p>Brain storming classroom discussion problem solving assignment</p> | <p>content Neatness completion</p> | | |
| <p>FEB.25</p> | <p>FINAL THEORY AND PRACTICAL EXAM</p> | | | | | | |

SIGNATURE OF HOD

(NEELAM BHARDWAJ)

SIGNATURE OF PRINCIPAL

(ANJU SHARMA)

| MONTH | CHAPTER | EXPECTED LEARNING OUTCOMES | PEDAGOGICAL APPROACH (TEACHING METHODS/ STRATEGIES) | ASSESSMENT TOOLS | RUBRICS | ART INTEGRATION | ICT INTEGRATION |
|-------|-----------------------------|---|---|--|-------------------|-----------------|-------------------------|
| APRIL | Electric Charges and Fields | 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 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). | Constructive and collaborative approach Explanation through examples and using various TLMS. Classroom discussion | Asking questions based on application of topic | Content, accuracy | Diagrams | Module on electrostatic |

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| | <p>Electrostatic Potential and Capacitance</p> | <p>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. 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).</p> | <p>Constructive and collaborative approach</p> <p>Explanation through examples and using various TLMS</p> <p>Classroom discussion</p> | <p>Asking questions and numerical Problems</p> | <p>Approach</p> <p>Formula</p> <p>Steps</p> <p>Unit</p> | <p>Draw equipotential surfaces</p> | <p>Module on electric potential and capacitance</p> |
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| JULY | CURRENT ELECTRICITY | 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 in parallel, Kirchhoff's rules, Wheatstone bridge. | Constructive, Inquiry based, Integrative | Lab Activity Question answer session Solving numerical | Concept Presentation Application | Diagram | Module on current electricity and its applications |
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| | <p>Moving Charges and Magnetism</p> | <p>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), 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.</p> | <p>Constructive, Inquiry based, Integrative</p> | <p>Discussion, And Explanation</p> | <p>Concept Presentation Application</p> | <p>diagrams</p> | <p>Module on magnetic effect</p> |
| <p>AUGUST</p> | <p>PRE MID TERM EXAMINATION</p> | | | | | | |

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| | <p>Magnetism and Matter</p> | <p>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), 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. 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</p> | <p>Constructivist, inquiry , Reflective</p> | <p>Oral Drill Pre Periodic Test Group activity Numerical Class Test</p> | <p>Content Effective formula calculation</p> | <p>Prepare a chart of formulae</p> | |
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| | | (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. | | | | | |
| | Electromagnetic Induction | Electromagnetic Induction Electromagnetic induction; Faraday's laws, induced EMF and current; Lenz's Law, Self and mutual induction. | Inductive – Deductive | Lab activity | Concept Presentation Application | Drawing diagrams | PPT on various Topics (let's speak) |
| SEPTEMBER | Alternating Current | 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. | Inquiry based Constructivist | | Approach Steps Accuracy | Role play (let's speak) | Module on AC |

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| | Electromagnetic Waves | 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. | Deductive Reflective | Lab Activity Assignment | Concept Presentation Application | | PPT |
| | Ray Optics | 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. | Discussion and Explanation | Worksheet Numerical Lab Activity | Concept Formula calculation setting of instruments, accuracy in results | Ray diagrams | PPT Module on ray optics |
| | MID TERM EXAMINATION | | | | | | |
| OCTOBER | Optical instruments | Optical instruments: Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers. | Constructivist, Reflective | Oral questions numerical MID TERM EXAM | Concept Application | | Module theory |

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| | Wave optics | 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. 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). | Constructivist, Reflective | Oral questions numerical | Concept Application | | Module on Huygens wave theory |
| NOVEMBER | Semiconductor Electronics Materials, Devices and Simple Circuits | 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. | Lecture, Classroom Discussion Constructivist approach Discussion and explanation taking examples of daily life | Worksheet Lab Activity Oral questions | Concept Presentation Application | Draw logic gates | Module on Boolean algebra |

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| Dual Nature of Radiation and Matter | 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. | Constructivist, and reflexive approach | Post mid term(Pre Board) Paper and Pen Test |  | Draw diagrams | Module on Dual Nature of Radiation and Matter |
| Atoms | Atoms Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model of hydrogen atom, Expression for radius of nth possible orbit, velocity and energy of electron in nth orbit, hydrogen line spectra (qualitative treatment only). | Constructivist, and reflexive approach | Worksheet Numerical and oral questions | Concept Presentation Application | Energy level diagram | |
| Nuclei | 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. | Constructivist, and reflexive approach | Worksheet Numerical and oral questions | Approach steps | | |
| DEC. | 1ST PRE BOARD EXAMINATION | | | | | |

JAN. 25

2nd PRE BOARD EXAMINATION(Starts From 30 December 2024)

FEB. 25

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