HAPPYDAYSSCHOOL,SHIVPURI(M.P.)

DEPARTMENTOFSCIENCE

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, binomialtheorem, trigonometric relations	Constructivist, inquiry	assignment problem solving	Content Neatness completion		
	UNIT AND MEASUREMENT	Need for measurement:Units of measurement; systemsofunits;SI units, fundamental and derived units. Significant figures. Dimensions of physical quantities, dimensionalanalysis and its applications.	Constructivist, reflective,inquiry	classroom discussion problem solving assignment experiment	Concept Presentation application		
	MOTION IN A STRAIGHTLINE	MotioninaStraight 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	Explain various types of motion in one dimension by plotting Graphs	

		uniform motion, and instantaneousvelocity, uniformly accelerated motion,velocity-time and position-time graphs. Relations for uniformly accelerated motion(graphical treatment).					
AUGUST	**FIRST PERIODIC ASSESSMENT**						
	MOTIONINA PLANE	Motion in a Plane Scalar and vector quantities; position and displacement vectors, general vectors and their notations;equalityof vectors,multiplication ofvectorsbyareal number;additionand subtractionofvectors Unitvector;resolution of a vector in a plane, rectangular components, Scalar and Vector product of vectors.Motionina plane, cases of uniformvelocityand uniform acceleration ,projectile motion,	Constructivist, reflective,inquiry based	Brain storming Problem based classroom discussion assignment	Content Neatness completion		Module-projectile and circularmotion

		uniform circular motion					
	LAWSOFMOTION	Intuitive concept of force, Inertia, Newton's first law of motion; momentum and Newton's second lawofmotion; 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 onNewton'sthreelaws of Motion.	
SEPTEMBER	WORKENERGY AND POWER	Work done by a constant force and a variable force; kinetic energy,workenergy theorem, power. Notionofpotential	Constructivist, reflective, Inquiry based	Brain storming classroom discussion problem solving	Concept Sequencing accuracy	Make simple models to show law of conservation of mechanical energy	

		energy, potential energy of a spring, conservative forces: non- conservative forces, motion in a vertical circle; elastic andinelasticcollisions inoneandtwo dimensions.					
	MOTION OF SYSTEM OF PARTICLES AND ROTATION	System of Particles andRotationalMotion Centreofmassofa two-particle system, momentum conservation and Centre of mass motion. Centre of massofarigidbody; centreofmassofa uniformrod.Moment of a force, torque, angular momentum, lawofconservationof angular momentum anditsapplications. Equilibriumofrigid bodies, rigid body rotation and equations ofrotationalmotion, comparisonoflinear and rotational motions.Momentof inertia, radius of	Constructivist, reflective inquiry based	Brain storming classroom discussion problem solving	Concept Sequencing Accuracy		Module-rigid bodies,moment of inertia

		gyration, values of moments of inertiafor simple geometrical objects (noderivation)					
OCTOBER	MIDTERMEXAMINATION						
	GRAVITATION	Gravitation, Newtons universal gravitational law, Kepler's laws, acceleration due to gravity and its variation with altitude and depth, gravitational field, potentialandpotential energy, escape velocity, orbital velocity, satellites,	Constructivist reflective,inquiry based	Brain storming classroom discussion problem solving experiment	Concept Presentation Application		
	MECHANICAL PROPERTIES OF SOLIDS	MechanicalProperties of Solids: Elastic behaviour, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity, Poisson'sratio;elastic energy.	Constructivist reflective,inquiry	Brain storming classroom discussion problem solving	Concept Presentation Application		threemodulusof elasticity
	MECHANICAL PROPERTIESOF FLUIDS	MechanicalProperties ofFluids:Pressuredue to a fluid column; Pascal'slawandits	Constructivist reflective, inquiry based	Brain storming classroom discussion	Concept Presentation Application	Make a simple model of venturimeter,atomizer	Modules on hydrostaticsand streamlinedand turbulent flow

		applications(hydraulic lift and hydraulic brakes), effectofgravityon fluid pressure. Viscosity, Stokes' law,terminalvelocity, streamline and turbulentflow,critical velocity,Bernoulli's theorem and its applications. Surface energy and surface tension, angle of contact, excess of pressure across a curved surface, applicationofsurface tensionideastodrops, bubblesandcapillary rise.		problem solving			

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NOVEMBER	OSCILLATION	Periodicmotion-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; oscillationsofaloaded spring- restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum derivation of expression for its time period..	Constructivist reflective,inquiry	Brain storming classroom discussion problem solving experiment	Concept Presentation Application		

	WAVE MOTION	Transverse and longitudinal waves, speed of travelling wave, displacement relation for a progressive wave, principle of superposition of waves, reflection of waves,standingwaves in strings and organ pipes,fundamental mode and harmonics, Beats.	Constructivist reflective,inquiry based	Brain storming classroom discussion problem solving	Concept Presentation Application		Module on wave motion

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	SECOND PERIODIC ASSESSMENT						
DECEMBER	THERMAL PROPERTIESOF MATTER	Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv - calorimetry; change of state-latent heat capacity. Heat transfer-conduction, convection and radiation, thermal conductivity, qualitative ideas of Blackbody radiation, Wien's displacement Law, Stefan's law .	Constructivist, reflective, inquiry based	Brain storming classroom discussion problem solving assignment	content Neatness completion	Drawdiagrams	

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JANURARY26	THERMODYNAMICS	Thermal equilibrium and definition of temperaturezerothlaw of thermodynamics, heat,workandinternal energy.Firstlawof thermodynamics, Second law of thermodynamics: gaseous state of matter, change of conditionofgaseous state -isothermal, adiabatic, reversible, irreversible,andcyclic processes. .	Constructivist, reflective ,inquirybased	Brain storming classroom discussion problem solving assignment	content Neatness completion		VideoCarnot's cycle

	KINETIC THEORY	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 equipartitionofenergy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.	Constructivist, reflective ,inquirybased	Brain storming classroom discussion problem solving assignment	content Neatness completion		
FEB.26	**FINALTHEORYANDPRACTICALEXAM**						

SIGNATURE OFHOD_____
(NEELAM BHARDWAJ)

SIGNATURE OF PRINCIPAL _____
(ANJU SHARMA)

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CLASS-XII-PHYSICS (042)

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, statementofGauss'stheorem 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

	Electrostatic Potentialand Capacitance	Electrostatic Potential and Capacitance Electric potential, potential difference, electric potential duetoapointcharge,adipole and system of charges; equipotential surfaces, electrical potential energy of asystemoftwo-pointcharges and of electric dipole in an electrostatic field. Conductors and insulators, free charges and bound charges inside a conductor. Dielectrics and electric polarization,	Constructive and collaborative approach Explanation through examples and using various TLMS Classroom discussion	Asking questions and numerical Problems	Approach Formula Steps Unit	Draw equipotential surfaces	Moduleonelectric potential and capacitance

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JULY	ELECTRIC POTENTIAL AND CAPACITANCE + CURRENT ELECTRICITY	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). 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	Moduleoncurrent electricity and its applications

	MovingCharges and Magnetism	Moving Charges and Magnetism Concept of magnetic field, Oersted's experiment. Biot- Savar tlaw and its application to current carrying circular loop. Ampere's law and its applicationstoinfinitelylong straight wire. Straight solenoid (only qualitative treatment), force on a moving charge in uniform magnetic andelectricfields.Forceona current-carryingconductorin a uniform magnetic field,.	Constructive,Inquiry based, Integrative	Asking questions Demonstration Discussion Application based questions	Concept Presentation Application	Diagrams	Module on magnetic effect
	PREMID TERMEXAMINATION						

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AUGUST	Magnetism and Matter	Forceona current-carryingconductorin a uniform magnetic field, force between two parallel current-carrying conductors- definition of ampere, torque experiencedbyacurrentloop 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)alongitsaxisand Perpendicular to its axis on a magnetic dipole (bar (qualitative treatment only), torque 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.	Constructivist,inquiry, Reflective	Oral Drill Pre Periodic Test Group activity Numerical Class Test	Content Effective formula calculation	Prepare a chart of formulae	

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	Electromagnetic Induction	Electromagnetic Induction Electromagnetic induction; Faraday'slaws,inducedEMF andcurrent;Lenz'sLaw,Self and mutual induction.	Inductive– Deductive	Lab activity	Concept Presentation Application	Drawing diagrams	PPTonvarious Topics (let's speak)
SEPTEMBER	Alternating Current	Alternating Current Alternating currents, peak andRMSvalueofalternating 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	Roleplay (let's speak)	ModuleonAC

	Electromagnetic Waves	Electromagnetic Waves Basic idea of displacement current, Electromagnetic waves,theircharacteristics, their transverse nature (qualitative idea only). Electromagnetic spectrum (radio waves, microwaves, infrared,visible,ultraviolet, X-rays, gamma rays) including elementary facts abouttheiruses.	Deductive Reflective	LabActivity Assignment	Concept Presentation Application		PPT
	RayOptics	Reflectionoflight,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.	Discussionand Explanation	Worksheet Numerical Lab Activity	Concept Formula calculation setting of instruments, accuracy in results	Raydiagrams	PPT Moduleonray optics
OCTOBER	**MIDTERM EXAMINATION**						
	Optical instruments	Optical instruments: Microscopes and astronomical telescopes (reflectingandrefracting) and their magnifying powers.	Constructivist, Reflective	Oralquestions numerical MIDTERM EXAM	Concept Application		Module theory

	Waveoptics	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 Huygenswave 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 characteristicsinforwardand reversebias,applicationof junction diode -diode as a rectifier.	Lecture, Classroom Discussion Constructivist approach Discussion and explanation taking examplesofdailylife	Worksheet Lab Activity Oral questions	Concept Presentation Application	Draw logic gates	Module on Boolean algebra

	Dual Nature of Radiation and Matter	DualNatureofRadiationand 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-Broglierelation.	Constructivist, and reflexive approach	Paper and Pen Test		Draw diagrams	ModuleonDual Nature of Radiation and Matter
	Atoms	Atoms Alpha-particle scattering experiment; Rutherford's model of atom; Bohr model of hydrogen atom, Expression for radius ofnthpossibleorbit,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	Energylevel diagram	
	Nuclei	NucleiCompositionandsize 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 reflexiveapproach	Worksheet Numericaland oral questions	Approach steps		
DEC.25	**1ST PRE BOARD EXAMINATION**						
	2nd PRE BOARD EXAMINATION						

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JAN.26	**2nd PRE BOARD EXAMINATION** **Practice of practical and revision**
FEB.26	**Revision, Remedial and doubt discussion**

SIGNATURE OFHOD_____ **SIGNATURE OF PRINCIPAL** _____

(NEELAM BHARDWAJ) **(ANJU SHARMA)**