CHOITHRAM SCHOOL, MANIK BAGH, INDORE

ANNUAL CURRICULUM PLAN SESSION 2017 – 2018

CLASS: XI

SUBJECT:PHYSICS

Month & Working Days	Theme/ Sub-theme	Learning Objectives		Activities &Resources	Expected Learning Outcomes	Assessment
		Subject Specific (Content Based)	Behavioural (Application based)			
June 15	Measurements Vectors/ Basic mathematical concepts, systems of units ,dimensional formulas, errors in measurements/ 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	• Understand the various systems of units • What is the utility of different units • Why different systems are introduced • Understand the systems of units in India and in other countries. • To understand the meaning of dimensional formula • Know the various kinds of errors. • Understand the concept of dot	• How the different units of same physical quantities are related. • Applications of units in export import purposes • Types of error can be possible. • How the mathematical tools are useful in minimizing errors. • Applying the knowledge of units in day to day life. • Apply the concept cross product in calculating the area of a parallelogram after finding the magnitude of cross product. Apply the concept in finding the direction of torque when we open a screw with the help of lever arm	**Lab Activities** **1.Determination of diameters of objects using vernier calipers .** **2.Determination of diameters of objects using screw gauge .** **3. Determination of radius of curvature by spherometer**	Students will learned • the various systems of units **the relation between different units of different systems** the concept of scalar and vector quantities • the concept of dot and cross product of two vectors. • the triangle ,polygon and parallelogram laws of vectors.	**Students will be asses on the basis of their observation and accuracy skills**

	components. Scalar and Vector product of vectors Relative velocity.	and cross product of two vectors. • Understand the triangle ,polygon and parallelogram laws of vectors.				
July 10	kinematics Frame of reference, Motion in a straight line: Position-time graph, speed and velocity. Elementary concepts of differentiation and integration for describing motion. Uniform and non-uniform motion, average speed and instantaneous velocity. Uniformly accelerated motion, velocity- time and position-time graphs. Relations for uniformly accelerated motion (graphical treatment).	Understand the difference between one dimension, two dimension and three dimensional motion • Understand the concept of uniform, non uniform and accelerated motion. • Understand the concept of average speed, instantaneous speed . • Understand the difference between speed and velocity . • State the projectile motion	• Apply the motion in 1D,2D and 3D motion in day to day life e.g. motion of train on straight track(1D),crawling of insect on a wall (2D) and motion of kite in sky(3D). • Apply the concept of x-t graph,v-t graph in calculating the velocity ,acceleration and retardation of a train ,vehicle moving with uniform and non uniform speed. • Apply the concept of projectile motion in calculating time of flight of a bag or bomb when they are being dropped from a plane. • Apply the concept instantaneous and average velocity during non	Lab Activities • Velocity of a ball on incline plane. • Velocity of pendulum when it passes through mean position and extreme position during oscillations.	Students will learn • to differentiate between one dimension, two dimension and three dimensional motion . • the concept of uniform ,non uniform and accelerated motion. • the concept of average speed, instantaneous speed . • the difference between speed and velocity . • the projectile motion ,maximum range,heightand time of flight. • the uniform and non uniform circular	**Students will be assess on the basis of observation and calculations skills**

		,maximum range, height and time of flight. State the uniform and non uniform circular motion	uniform motion and in speedometer. ● Apply the concept of max.range of a ball in a match and with the same effort a sportsman can increase the range of his shot if he hit the ball at an angle of 45 degree,		motion. .	
July 10, August10	Laws of Motion - force (balanced and unbalanced force) and motion, Newton's laws and its applications, inertia, momentum, Impulse, law of conservation of linear momentum. Connected pullies and elevator problems	● Understand the difference between balanced and unbalanced forces. ● Understand the concept of force. ● Understand the concept of inertia and its types. ● Understand the keys of Newton's laws. ● Formulate the Newton's second law of motion. ● Understand the concept of momentum and impulse.	● Apply the inertia of rest and motion like when a person standing in a bus falls backward when bus is start moving suddenly. ● analyze the concept of Newton's laws in daily actions like when a fielder pulls his hand backward; while catching a cricket ball ● Apply the concept of impulse and momentum in cricket or any game during collision.	**Lab Activity** **Verification of law of parallelogram** **And determination of unknown force.**	● Student will learn concept of force and difference between balanced and unbalanced forces. ● They have learned the concept of inertia and its type. ● They have learned the keys of Newton's laws. ● They have learned the to formulate the Newton's second law of motion. ● They have learned the concept of momentum and impulse. ● They have learned the concept and types of collision. ● and Momentum of body ● They have learned the	**Logical and application skills will be asses by giving numerical questions on**

					application of inertia of rest and motion in day to day life • They have learned the application and concept of Newton's laws in daily actions.	
August 10	Work power and Energy/ Scalar product of vectors. Work done by a constant force and variable force, kinetic energy ,work energy theorem, power. Notion of potential energy, potential energy of a spring, conservative forces, conservation of mechanical energy, non conservative forces, elastic and inelastic collisions in one and two dimensions.	• Understand the concept of Scalar Product, Work Done By Constant Force And Variable Force • Understand concept of kinetic energy ,work energy theorem and power. • State the work energy theorem. • Understand the concept potential potential energy. Understand the concept of conservative and non conservative forcer	• Apply the concept of concept of conservative and non conservative force in terms of smart working and hard working. • For proper output in working the importance of direction. • Apply the concept of work energy theorem in routine that whatever amount of energy we have accordingly we do the work By using the concept of potential energy we can increases the efficiency of work done	Class Room Activities • By demonstrating the activity using spring balance and bob the potential energy stored in an object will be explained. And by law of conservation of energy the speed of an object when falling from a certain height will be calculated and using the value of speed kinetic energy will be calculated	Students will learn • The concept Work done by a constant force and variable force • The application of law of conservation of energy. • To differentiate between elastic and inelastic collision. • Different types of work done .	**On the basis of observation and calculations skills**
September	Centre of mass and	• the concept of	• How the energy can be	• **Determination of**	• **Students will learn**	**Students will be**

| 20 | Rotational Motion and Gravitation Kepler's laws of planetary motion. The universal law of gravitation, Acceleration due to gravity and its variation with altitude and depth, gravitational potential energy, gravitational potential, Escape velocity, critical velocity, orbital velocity of a satellite. Geostationary satellite centre of mass of two-particle system, momentum conservation and centre of mass motion, centre of mass of rigid body, centre of mass of uniform rod. Vector product of vectors, moment of force, torque, angular momentum, conservation of angular momentum | orbital and escape velocity.
 • State the Newton's law of gravitation and Kepler's law of planetary motion
 • Understand to differentiate gravity and gravitation.
 • Understand concept of acceleration due to gravity.
 • Understand to differentiate gravitational potential and gravitational potential energy.
 • Understand the concept of centre of mass.
 • Understand concept of vector product of vectors.
 • Understand the concept of equilibrium.
 • Understand the | utilize in fruitful work that can be learned by the concept of potential.
 • By the law of gravitation when body thrown up finally falls down towards the earth Therefore we have to be down to earth.

 • Application of concept of centre of mass in balancing the temperament opposite circumstances
 • Using concept of torque how a door can be opened and closed same as the handle of a bicycle can turn the rim
 • Concept of equilibrium can be used in balancing the contradictions in life. | **acceleration due to gravity by simple pendulum**
 • **Using pendulum of different masses ,verification of laws of time period** | • **How the launching of satellite is done**
 • Variation in acceleration due o gravity with height and depth.
 • Potential and gravitational potential energy.
 How the energy of satellite is calculated
 • The concept of centre of mass
 • the concept of moment of inertia.
 The concept of torque and applications of torque | **assess on the basis of observation and calculations skills** |

	with some examples. Equilibrium of rigid bodies, comparison of linear and rotational motion, moment of inertia and radius of gyration.Values of moments of inertia for simple geometrical object, statement of parallel and perpendicular axes theorem and their applications.	concept of torque, angular momentum. • State the theorem of parallel axes and perpendicular axes. .				
October	Gravitation/Satellite motion	Revision /Exam	Revision/Exam	---	---	----
November 22	Properties of Matter: **1.Solids-Elastic behavior of solids, stress, strain, elastic limit, Hook's law, Modulus of elasticity, potential energy in a starched wire,poisson;s ratio, thermal stress** **2. Hydrostatics(fluids at rest); Pressure**	• **Understand the concept Elasticity** • **Understand concept of Pressure of liquid, intermolecular forces** • **State the Pascal's law and Hook's law, Stoke's law, Bernoulli's theorem.** o **Understand the concept surface**	• Apply Hook's law in day to day life as a limit of flexibility in behavior according to the situation • Apply the Pascal's law to reduce the pressure in life by distributing it in different ways. • Applications principle of floatation in kipping the things stable in day to day life. • Apply the concept of viscosity by using lubricants in automobiles	Lab Activities • Determination of terminal velocity and surface tension of. **gylicrine by throwing steel balls and using stop clock the time to travel a specific distance, the velocity will be calculated** • Determination of Yung's modulus of elasticity by Sear'ls apparatus	• The concept **Elasticity** The application of Pascal's law. • The **concept of surface tension of liquid, surface energy** • The applications **Bernoulli's theorem** • **Thermal properties of matter, Heat, Temperature,** • **Anomalous expansion of water, expansion of gases,** • **Specific heat**	**Students will be assess on the basis of observation and calculations skills**

of liquid, applications of concept of pressure, density, hydrostatic paradox, Pascal's law, Atmospheric pressure, Buoyancy intermolecular forces, important terms related to study of surface tension of liquid, surface tension, surface energy, excess pressure, angle of contact, capillarity, ascent formula. **3.Hydrodynamics; viscosity, Poiseuille's formula, Stoke's law, terminal velocity, streamline turbulent and Laminar flow, critical velocity, Reynold's number, equation of continuity, Bernoulli's theorem, Blood**	**tension of liquid, surface energy** o **Define angle of contact , critical velocity, Specific heat capacity, water equivalent, latent heat, principal specific heats of gas.** • Understand the applications of Pascal's law in Hydraulic lifts and breaks, • Understand v**arious parts of human bodies carries different blood pressure .** • Understand why the cooking utensils are provided with wooden handles .	and other machinery. • Apply the concept of reflecting and absorbing properties of a substance food items can keep fresh, using silver foils.		**capacity, water equivalent,** • **change of state, latent heat, calorimetric, two principal specific heats of gas** **.**	

	pressure. **4. Thermal properties of matter; Heat, Temperature, thermal expansion, types of thermal expansion, Anomalous expansion of water, expansion of gases, Specific heat capacity, water equivalent, change of state, latent**				

December 15	Thermodynamics and KTG/ **Thermal equilibrium, Zeroth law of thermodynamics, thermodynamic state variables and equation of state, indicator diagram or p-v diagram, isothermal change, Adiabatic change, slopes and work done of isothermal and adiabatic changes, isobaric and isochoric changes, first law of thermodynamics, Applications of the first law ,cuclic and non cyclic process, heat engine, carnot engine, principle of refrigerator, second law of thermodynamics.** gases - assumptions, concept of pressure. Kinetic	• **Understand the concept thermal equilibrium** • **Understand the terms thermodynamic variables** • **State Zeroth law, first law, second law, of thermodynamics.** ◦ **Understand the mechanism of carnot engine and heat engine.** Understand v**arious process of thermodynamics**	• How the concept of heat engine applied in petrol engine and diesel engine. • How the efficiency of an engine can be increased. • Create the interest in mechanical. And petroleum engineering.	Lab Activity Verification of Newton's law of cooling		• **The meaning of thermodynamics** • **The concept of isothemal process and adiabatic process.** • **The principle and working of refrigerator, heat engine.**	**Students will be assess on the basis of observation and calculations skills**

	interpretation of temperature; rms 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					
January 22	**Oscillations and Waves**	• **Understand the concept of**	○ The concept of free and forced	Lab activities • Concept of periodic motion	Students wii have learn - • the concept of Periodic	**Students will be assess on the**

Periodic motion - time period, frequency, displacement as a function of time. Periodic functions. Simple harmonic motion (S.H.M) and its equation; phase; oscillations of a spring–restoring force and force constant; energy in S.H.M. Kinetic and potential energies; simple pendulum– derivation of expression for its time period. Free, forced and damped oscillations (qualitative ideas only), resonance. Wave motion. Transverse and longitudinal waves, speed of wave motion. Displacement relation for a progressive wave. Principle of superposition of waves, reflection of waves, standing	Periodic motion • **Understand the terms** time period, frequency, displacement as a function of time • **Understand the** Free, forced and damped oscillations (qualitative ideas only), resonance • **Understand** Wave motion. Transverse and longitudinal waves, speed of wave motion. Displacement relation • for a progressive wave. Principle of superposition of waves, reflection of waves, standing • Understand Principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, fundamental mode and harmonics, Beats, Doppler effect	oscillations is used in constructions of buildings o Concept of time period can be applied while swinging. o In different musical instruments concept of superposition of waves can be applied o How Dopplers effect is used to determine the distance of objects on the basis of reflection of sound	and oscillations with the help of simple pendulum. • Formation of stationary waves by sonometer • Formation of stationary waves by resonance column	motion • time period, frequency, • Free, forced and damped oscillations • Wave motion. Transverse and longitudinal waves, speed of wave motion. Displacement relation • Principle of superposition of waves, reflection of waves, standing • Understand Principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, fundamental mode and harmonics, Beats, Doppler effect	**basis of observation and calculations skills**

	waves in strings and organ pipes, fundamental mode and harmonics, Beats, Doppler effect				