

**The Orchid School
Baner
Weekly Syllabus Overview 2015- 2016
Std : XI
Subject : Physics**

Month	Lesson / Topic	Expected Learning Objective	Activities/ FAs Planned	Remark
March				
APRIL	Physical World and Measurement : Physics - scope and excitement; nature of physical laws; Physics, technology and society.	students understand about nature of physics and gain knowledge about how physics is related to technology	1.To measure diameter of a small spherical/cylindrical body using Vernier Calliper	
	Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements;	students understand need for measurements and gain knowledge about SI units.		
	accuracy and precision of measuring instruments; errors in measurement; significant figures.	students understand about accuracy and error measurements in precision measuring instruments		

	Dimensions of physical quantities, dimensional analysis and its applications. without dielectric medium between the plates, energy stored in a capacitor.	students understand about dimensional analysis	Activity 1: To make a paper scale of given least count, e.g., 0.2cm, 0.5 cm.	
MAY	Kinematics : Frame of reference, Motion in a straight line: Position-time graph, speed and velocity. Elementary concepts of differentiation and integration for describing motion.	students understand about different types of graphs and gain knowledge about motion in a straight line	2. To measure diameter of a given wire and thickness of a given sheet using screw gauge.	
	Uniform and nonuniform motion, average speed and instantaneous velocity.	students understand about different types of motion and gain knowledge about speed and instantaneous velocity	3. To determine volume of an irregular lamina using screw gauge.	
JUNE	Uniformly accelerated motion, velocity time and position-time graphs. Relations for uniformly accelerated motion (graphical treatment) Scalar and vector quantities;	students understand about uniformly accelerated motion gain knowledge about scalar and vector quantities	4. To determine radius of curvature of a given spherical surface by a spherometer.	
	Position and displacement vectors, general vectors and their notations; equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors	students understand about vector and their notations and acquire knowledge about properties of vectors	5. To determine the mass of two different objects using a beam balance.	

	Relative velocity. Unit vector; Resolution of a vector in a plane - rectangular components. Scalar and Vector product of vectors.	students understand the concept of relative velocity and gain knowledge about product of vectors	6. To determine radius of curvature of a given spherical surface by a spherometer.	
	Motion in a plane. Cases of uniform velocity and uniform acceleration-projectile motion. Uniform circular motion.	students understand motion in a plane	7. To determine the mass of two different objects using a beam balance. Activity 3: To measure the force of limiting friction for rolling of a roller on a horizontal plane.	
UT 1				
	Laws of Motion : Intuitive concept of force. Inertia, Newton's first law of motion;	students gain knowledge about Newton's first law of motion	8. To find the weight of a given body using parallelogram law of vectors.	
	momentum and Newton's second law of motion; impulse; Newton's third law of motion.	students gain knowledge about Newton's third law of motion	9. Using a simple pendulum, plot L-T and L-T ² graphs. Hence find the effective length of second's pendulum using appropriate graph.	

JULY	Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces. Static and kinetic friction,	students gain knowledge about law of conservation of linear momentum	Activity 3: To measure the force of limiting friction for rolling of a roller on a horizontal plane.	
	laws of friction, rolling friction, lubrication. Dynamics of uniform circular motion:	students gain knowledge about laws of friction		
	Centripetal force, examples of circular motion (vehicle on a level circular road, vehicle on banked road).	students understand the concept of circular motion		
AUG	Work, Energy and Power : Work done by a constant force and a variable force;	students understand the concept of work	Activity 4:To observe and explain the effect of heating on a bi-metallic strip.	
	kinetic energy, work-energy theorem, power. Notion of potential energy, potential energy of a spring,	students gain knowledge about kinetic energy power and potential energy	10. To determine Young's modulus of elasticity of the material of a given wire.	
	conservative forces: conservation of mechanical energy (kinetic and potential energies); non-conservative forces: motion in a vertical circle;	students understands the difference between conservative and non conservative force	11. To find the force constant of a helical spring by plotting a graph between load and extension.	
	elastic and inelastic collisions in one and two dimensions.	students gain knowledge about elastic and inelastic collisions		

SEPT	Centre of mass of a two-particle system, momentum conservation and centre of mass motion.	students understand the centre of mass	12. To study the variation in volume with pressure for a sample of air at constant temperature by plotting graphs between P and V, and between P and $1/v$.	
	Centre of mass of a rigid body; centre of mass of a uniform rod.Moment of a force, torque,	students gain knowledge about moment of a force and torque	13.To determine the surface tension of water by capillary rise method.	
	angular momentum, laws of conservation of angular momentum and its applications.Equilibrium of rigid bodies,	students acquire knowledge about laws of conservation of angular momentum	14. To determine the coefficient of viscosity of a given viscous liquid by measuring terminal velocity of a given spherical body.	
	rigid body rotation and equations of rotational motion,	students gain knowledge about equations of rotational motion,		
	comparison of linear and rotational motions.	students understand linear and rotational motions.		
Term 1 Exam				

OCT	Keplar's laws of planetary motion.The universal law of gravitation. Acceleration due to gravity and its variation with altitude and depth.	students gain knowledge about Keplar's laws of planetary motion and the universal law of gravitation.	15.To study the relation between frequency and length of a given wire under constant tension using sonometer.	
	Gravitational potential energy and gravitational potential. Escape velocity. Orbital velocity of a satellite.	students gain knowledge about Gravitational potential energy and escape velocity		
	Geo-stationary satellites. Properties of bulk matter:Elastic behaviour, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear modulus of rigidity,	students understand properties of blk matter ,hook's law		
	Poisson's ratio; elastic energy. Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes)	students acquire knowledge about poisson's ratio and pascal's law and its application	<u>Activity 5:To study the effect of detergent on surface tension of water by observing capillary rise.</u>	
Properties of Bulk matter : Effect of gravity on fluid pressure.Viscosity, Stokes' law, terminal velocity, streamline and turbulent flow, critical velocity	students gain knowledge about Stokes' law, terminal velocity, streamline and turbulent flow, critical velocity	16To find the speed of sound in air at room temperature using a resonance tube by two resonance positions.		

NOV	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.	students acquire knowledge about Bernoulli's theorem and its applications.		
	Heat, temperature, thermal expansion; thermal expansion of solids, liquids and gases, anomalous expansion of water; specific heat capacity; Cp, Cv - calorimetry	students understand thermal expansion of solids, liquids and gases. students gain knowledge about Cp, Cv {specific Heat}		
DEC	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, Green house effect.	students gain knowledge about latent heat capacity. students acquire knowledge about blackbody radiation		
	Oscillations and Waves : Periodic motion - time period, frequency, displacement as a function of time. Periodic functions. Simple harmonic motion (S.H.M) and its equation; phase;	students gain knowledge about Oscillations and Waves		

	oscillations of a spring-restoring force and force constant; energy in S.H.M. Kinetic and potential energies;	students understand oscillations of a spring		
	simple pendulum derivation of expression for its time period. Free, forced and damped oscillations (qualitative ideas only), resonance.	students acquire knowledge about simple pendulum.students understand		
UT 2				
JAN	Oscillation and Waves : 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),	students understand Energy in S.H.M. Kinetic and potential energies; simple pendulum derivation of expression for its time period.		
	resonance , Wave motion. Transverse and longitudinal waves, speed of wave motion. Displacement relation for a progressive wave	students understand the concept of resonance		
	Principle of superposition of waves, reflection of waves, standing waves in Strings and organ pipes, fundamental mode and harmonics, Beats, Doppler effect.	students understand motion in a plane		

	Revision for Session Ending Exam.			
FEB	Thermal equilibrium and definition of temperature (zeroth law of thermodynamics). Heat, work and internal energy. First law of thermodynamics. Isothermal and adiabatic processes. Second law of thermodynamics: reversible and irreversible processes.	students understand linear and rotational motions.		
	Heat engine and refrigerator. Behaviour of Perfect Gases and Kinetic Theory of Gases : Equation of state of a perfect gas, work done in compressing a gas. Kinetic theory of gases - assumptions, concept of pressure.	students gain knowledge about latent heat capacity. students acquire knowledge about blackbody radiation Heat engine and refrigerator. Behaviour of Perfect Gases and Kinetic Theory of Gases	Activity 6: To study dissipation of energy of a simple pendulum by plotting a graph between square of amplitude and time.	
	Kinetic interpretation of temperature; rms speed of gas molecules degrees of freedom, law of equi-partition of energy (statement only) and application to specific heat capacities of gases; concept of mean free path, Avogadro's number.	students understand Kinetic interpretation of temperature; rms speed of gas molecules degrees of freedom, students acquire knowledge about Avogadro's No		

Final Exam	
-----------------------	--