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YEAR PLAN   2018 – 2019
Grade XI Physics

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The academic year is divided into three sessions.
Session One: June to August 2018.
Session Two: September 2018 to December 2018.
Session Three: January 2019 to March 2019.
Monthly Tests: June, July, October, January
Term Exam I – August 2018.
Term Exam II - December 2018.
Term Exam III –March 2019.
AIM : To understand principles of Physics and their application in daily life situations.
ENDURING UNDERSTANDING: An understanding of the world around them and an appreciation for the underlying laws that govern it.
GENERAL OBJECTIVES : An increased ability to solve any problems that they may encounter in the various examinations.
   Acquisition of knowledge and understanding of terms, concepts, facts, processes, techniques and principles relating to Physics.
   To develop the ability to apply the knowledge of contents and principles of Physics in new and unfamiliar situations.

Duration	Topics/Units	Specific Learning Objectives	Activities	Resources
June	**Physical World And Measurement** Importance of measurement in scientific studies. Systems of units, List of fundamental, supplementary and derived physical quantities, their units and symbols, subunits and multiple units using prefixes as powers of 10. Accuracy of measurement, errors in measurement, significant figures, dimensions of physical quantities Use of dimensional analysis. **Kinematics** Kinematics Frame of reference, concept of point mass, rest and motion, distance and displacement, speed and velocity, s-t, v-t, and a-t graphs for uniform acceleration and the conclusions drawn from these graphs.	To develop an intuitive understanding of units and applying accuracy principles. Defining terms in motion and interpreting graphs. Understanding projectile motion.	Class room discussion Practice questions	ISC Physics –Kumar. Mittal, ISC Physics (Vivekanandan), New Millennium Physics (SK Sharma, R Jerath), ABC of Physics (Satish Gupta)
July	Kinematic equations of motion for objects in uniformly accelerated motion, motion of an object under gravity, Differentiation as a rate of change; examples –speed, acceleration, velocity gradient. Motion in a plane. Scalars and vector quantities, position and displacement vectors addition and subtraction of vectors, parallelogram law of vectors. Addition and subtraction of vectors in terms of unit vectors resolution of vectors, dot product and cross product, concept of relative velocity. Projectile motion, various terms related to projectile motion. **Monthly Test**		Explanation Practise sums Discussion on projects as per syllabus Peer learning Teacher guided work, Independent work	ISC Physics –Kumar. Mittal, ISC Physics (Vivekanandan), New Millennium Physics (SK Sharma, R Jerath), ABC of Physics (Satish Gupta)
August	**Laws of Motion** Laws of motion Newton's first law of motion Concept of inertia, mass, force, Newton's second law of motion , principle of conservation of momentum, impulse Newton's third law of motion, friction Friction, laws of friction, motion along a rough inclined plane angle of friction, angle of repose, lubrication, use of bearings, streamlining etc uniform circular motion. **Term I Exams**	To state Newton's laws and apply in practical situations.	Student presentations Brainstorming Class room discussion Practice problems Lecture Peer learning Teacher guided work, Independent work	ISC Physics –Kumar. Mittal, ISC Physics (Vivekanandan), New Millennium Physics (SK Sharma, R Jerath), ABC of Physics (Salish Gupta)

September	**Work, Power and Energy** Work done by a constant force and a variable force, kinetic energy, work energy theorem and power. Potential energy, potential energy of a spring, conservative forces, conservation of mechanical energy, conservative and non-conservative forces. Concept of collision, elastic and inelastic collision.	To appreciate work being done and relate to energy and power .Understand the underlying principles of collisions. Understand the underlying principles of collisions.	Brainstorming Class room discussion Practice problems Lecture Peer learning Teacher guided work, Independent work	ISC Physics –Kumar. Mittal, ISC Physics (Vivekanandan), New Millennium Physics (SK Sharma, R Jerath), ABC of Physics (Satish Gupta)
October	**Motion of system of particles and Rigid body** Idea of centre of mass, momentum conservation and centre of mass motion, Centre of mass of a rigid body, centre of mass of a uniform rod. Moment of force , torque angular momentum Laws of conservation of angular momentum and its applications, equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparative study of linear and rotational motion. Moment of inertia, radius of gyration, MI of simple geometrical objects, Statement of parallel and perpendicular axes theorems and their applications. **Gravitation** Gravitation Kepler's laws of planetary motion, universal law of gravitation acceleration due to gravity, variation of g with altitude, latitude and depth.	To appreciate the type of motion in rigid bodies and explain the axes theorems. To gain an understanding about the relationship between mass and force of gravity, to learn about the theory involved in launching of satellites.	Brainstorming Class room discussion Practice problems Lecture Peer learning Teacher guided work, Independent work	ISC Physics –Kumar. Mittal, ISC Physics (Vivekanandan), New Millennium Physics (SK Sharma, R Jerath), ABC of Physics (Satish Gupta)
November	Gravitational potential and gravitational potential energy, escape velocity, orbital velocity, Geostationary satellites. **Properties of Bulk Matter** Mechanical properties of Fluids. Pascal's law and its applications Viscosity, Stokes' law, terminal velocity, critical velocity Bernoulli's theorem and its applications surface energy, excess pressure across a curved surface, Surface Tension , application of surface tension ideas to drops, bubbles and capillary rise	To investigate properties of solids and liquids.	Brainstorming Class room discussion Practice problems Lecture Peer learning Teacher guided work, Independent work	ISC Physics –Kumar. Mittal, ISC Physics (Vivekanandan), New Millennium Physics (SK Sharma, R Jerath), ABC of Physics (Satish Gupta)
December	Revision Term Exams II Farewell X'mas Holidays	To develop an understanding of all topics for the term Revise all topics and reinforcement done if needed	Discussion and Practise sums, Revision tests	Past papers and Specimen papers
January	**Heat and Thermodynamics** Thermal properties of Matter, Heat, temperature, thermal expansions of solids, liquids and gases, anomalous expansion of water, specific heat capacity Change of state, specific latent heat capacity Heat transfer- conduction, convection and radiation, Black body radiation Wein's displacement law and green house effect Thermodynamics. Thermal equilibrium and definition of temperature, heat, work and internal energy. First law of thermodynamics, isothermal and adiabatic processes Second law of thermodynamics. Reversible and irreversible processes, Heat engine and	To give an introduction to heat and thermodynamics and do further investigations. State the laws of Thermodynamics and its implications.	Brainstorming Class room discussion Practice problems Lecture Peer learning Teacher guided work, Independent work	ISC Physics –Kumar. Mittal, ISC Physics (Vivekanandan), New Millennium Physics (SK Sharma, R Jerath), ABC of Physics (Satish Gupta)

	refrigerator. **Behaviour of Perfect gases and Kinetic Theory** Kinetic theory, Equation of state of a perfect gas, concept of pressure. **Monthly Test**	To appreciate the Kinetic theory and apply its principles to obtain gas laws.		
February	**Oscillation and waves** Oscillations and Waves. Oscillations, Periodic motion, time period, frequency, displacement as a function of time, periodic function SHM and its equation, phase oscillations of a spring, restoring force, force constant, energy in SHM Kinetic energies and potential energies simple pendulum, free, forced and damped oscillations. Waves, Transverse waves, longitudinal waves speed of wave motion, progressive wave, principle of superposition Reflection of waves, standing waves in strings and organ pipes, fundamental mode and harmonics, Beats, Doppler effect. Revision Summative Assessment III	Recall previous terms related. Explain SHM in depth and solve problems. Apply Doppler Effect in daily life situations.	Brainstorming Class room discussion Practice problems Lecture Peer learning Teacher guided work, Independent work	ISC Physics –Kumar. Mittal, ISC Physics (Vivekanandan), New Millennium Physics (SK Sharma, R Jerath), ABC of Physics (Satish Gupta)
March	**Term 3 Examination**			

Projects/ Field trips: As per the guidelines given by ISC

Practicals 1. Measurement by Vernier callipers.   6. To find the force constant of a spring .
2. Find the diameter of a wire using a micrometer screw gauge.   7. To find the downward force acting along the inclined plane
3. Determine radius of curvature by a spherometer.   8. To study the fall in temperature of a body with time.
4. To verify the parallelogram law of forces.   9. To study the variation in frequency of air column with length using resonance column
5. To find the acceleration due to gravity by simple pendulum.   10. To determine frequency of a tuning fork using a sonometer.

Facilitators' name: Mrs Renjini Sanjay
Textbook: ISC Physics –Kumar. Mittal

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