# ACADEMIC YEAR PLAN : 2023 - 24

| Name of the Subject : Physics Part -1 | | | Class: XI A &B | | |
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| **Name of the Month/ No. of periods** | **Name of the Unit / Topics** | **Learning Outcomes** | **Suggested Activities / Projects under internal assessment/ Practicals** | **Assignment** | **Assessment** |
| **APRIL -JUNE (18)** | 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 nonuniform Motion, average speed and instantaneous velocity. Uniformly accelerated motion, velocity Time and position-time graphs. Relations for uniformly accelerated motion (graphical treatment). | Students will be able to--- *understand Frame of reference *discuss motion in a straight line *Plot Position-time graph, speed and velocity.velocity -time and position-time graphs. *understand elementary concepts of differentiation and integration for describing motion. *differentiate Uniform and nonuniform Motion, average speed and instantaneous velocity. understand uniformly accelerated motion *derive relations for uniformly accelerated motion (graphical treatment). | **EXP**.: 1) To measure diameter of a small spherical/cylindrical body and to measure internal diameter and depth of a given beaker/calorimeter using Vernier Callipers and hence find its volume. 2) To measure diameter of a given wire and thickness of a given sheet using screw gauge **Activity** : 1) Make a flow chart of types of motion. | *Worksheets *Short answer type questions *Numericals based on each topic *Competency based questions *Practical based questions | Class test |
| **JULY (06)** | **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. Relative velocity. 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. Uniform circular motion. | Students will be able to--- * Understand scalar and vector quantities; Position and displacement vectors, general vectors and their notations, unit vector, zero vector equality of vectors *Do multiplication of vectors by a real number; addition and subtraction of Vectors. *understand relative velocity. * resolve a vector in a plane - rectangular components. * DoScalar and Vector product of vectors. *understand Motion in a plane. Cases of uniform velocity and uniform acceleration-projectile motion. *understand Uniform circular motion. | **Activity:** 1) Change in direction of total velocity of an object at different points on trajectory. 2)Make a concept map of Vector. **EXP.**: 3) To find the weight of a given body using parallelogram lawof vectors. | *WorksheetsWorksheets *Short answer type questions *Numericals based on each topic *Competency based questions *Practical based questions. | PT-1 |

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| **AUGUST (14)** | **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 . | Students will be able to---- *understand intuitive concept of force. Inertia, *explain Newton's first law of motion; momentum and Newton's second law of motion; impulse; Newton's third law of motion. *discuss law of conservation of linear momentum and its applications. * understand equilibrium of concurrent forces. | **Activities**: 1) Activities based on Newton's laws of motion---1st law -wsing card,coin and glass,2nd law-heavier and lighter balls falling on sand, 3rd law-activity with two straw 2) Activity showing impulse momentum theorem(put a sand slowly and then throught stone on sand- impressions are different. | *Worksheets *Short answer type questions *Numericals based on each topic *Competency based questions *Practical based questions | Class test Worksheet |
| **SEPTEMBER** | 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 banked road). | Students will be able to--- differentiate static and kinetic friction, *prove laws of friction, rolling friction, *understand dynamics of uniform circular motion *understand the concept of centripetal force and they will discuss examples of circular motion (vehicle on a Level circular road, vehicle on banked road). | **EXP.**:4) To study the relationship between force of limiting friction and normal reaction and to find the coefficient of friction between a block and a horizontal surface. **Activity.**:1) Direction of centripetal and centifugal force. | *Worksheets *Short answer type questions *Numericals based on each topic *Competency based questions *Practical based questions | TERM-1 |
| **OCTOBER (14)** | **Work, Energy and Power** Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power. Notion of potential 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. | Students will be able to--- *derive work done by a constant force and a variable force *define kinetic energy *derive work-energy theorem, power. *Notion of potential energy, potential energy of a spring, conservative forces: non-conservative forces: *understand motion in a vertical circle *understand elastic and inelastic collisions in one and two dimensions. | **Activities:** 1) Activity to show total energy of a system remains constant throughout the motion. 2) Demonstration to show collision in one dimension and its different cases. **Project** | *Worksheets *Short answer type questions *Numericals based on each topic *Competency based questions *Practical based questions | Competency based questions |

| Month | Topic / Content | Learning Outcomes | Activities | Assessment | |
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| **NOVEMBER (18)** | Motion of System of Particles and Rigid Body<br>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.<br>Moment of a force, torque, angular momentum, laws of conservation of angular momentum and its applications.<br>Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motions.<br>Moment of inertia, radius of gyration. Values of moments of inertia for simple geometrical objects (no derivation ). | Students will be able to---<br>*understand centre of mass of a two-particle system,<br>*understand momentum conservation and centre of mass motion.<br>*discuss Centre of mass of a rigid body; centre of mass of a uniform rod.<br>Moment of a force, torque, angular momentum<br>*understand laws of conservation of angular momentum and its applications.<br>*understand the concept of equilibrium of rigid bodies, rigid body rotation and equations of rotational motion<br>*compare of linear and rotational motions. *understand the moment of inertia, radius of gyration.<br>*derive values of moments of inertia, for simple geometrical objects (no derivation ). | **Activities:** 1) Virtual lab activity: Find out the  values torque, moment of inertia and angular momentum for the following values of angular velocities= 1,2,2,3for positions 1,2,3,4<br>2) Balancing of scale to explain torque concept.<br>3) balancing of scale on fingers to explain concept of centre of mass. | *Worksheets<br>*Short answer type questions<br>*Numericals based on each topic<br>*Competency based questions<br>*Practical based | Numericals worksheet |
| **DECEMBER (12)** | Gravitation<br> Keplar's laws of planetary motionThe universal law of gravitation.<br>Acceleration due to gravity and its variation  with altitude and depth.<br>Gravitational potential energy and gravitational potential. Escape velocity. Orbital velocity of a Satellite. | Students will be able to ----<br> Discuss Keplar's laws of planetary motion<br>*State Universal law of gravitation.<br>*derive acceleration due to gravity and its variation  with altitude and depth.<br>*understand gravitational potential energy and gravitational potential.<br>*define and derive expression of escape velocity and Orbital velocity of a Satellite. | **Act (1)**. To make a paper scale of given least count, e.g., 0.2,0.5cm<br>**Act (2).** To measure the force of limiting friction for rolling of a roller on a horizontal plane.<br>**Act (3).** To study the conservation of energy of a ball rolling down on an inclined plane (using a double Inclined plane). | *Worksheets<br>*Short answer type questions<br>*Numericals based on each topic<br>*Competency based questions | PT-2 |
| **JANUARY** | **Chapterwise** | Revision | | | |
| *FEBRUARY* | *Full syllabus* | | | | *TERM-2* |