**CURRICULUM PLAN 2024-25**

Odd Semester: I, III, V

**Dr. V. Bhasker Raj**

Department of Physics

**B.Sc. Physical Science – I Year, I Sem,**

**Core Paper: Mechanics**

|  |  |  |  |
| --- | --- | --- | --- |
| Content | Allocation of Lectures | Month-wise Schedule followed | Tutorial/assignment/  presentation etc |
| **Mechanics** | | |  |
| **Unit1: Review of vectors and ordinary differential equation:**  Gradient of a scalar field, divergence and curl of vectors field, polar and axial vectors  Second order homogeneous ordinary differential equations with constant coefficients  (Operator Method Only). | 4 | 30-Aug to 12-Sep | Syllabus Overview  Reference books  Problem solving  Derivations and Numericals |
| **Unit 2: Fundamentals of Dynamic:**  Dynamics of a system of particles, centre of mass, determination of centre of mass for  discrete and continuoussystems having spherical symmetry  Conservation of momentum and energy, Conservative and non-Conservative forces,  work – energy theorem for conservative forces, force as a gradient of potential energy.  Particle collision (Elastic and in-elastic collisions) | 7 | 13-Sept to 08-Oct | Derivations and  Numericals  Class test on unit end  Discussion of  Important questions |
| **Unit 3: Rotational Dynamics and Oscillatory Motion:**  Angular momentum, torque, conservation of angular momentum, Moment of inertia,  Theorem of parallel and perpendicular axes (statements only). Calculation of moment  of inertia of discrete and continuous objects (1-D and 2-D).  Idea of simple harmonic motion, differential equation of simple harmonic motion and  its solution, Motion of simple pendulum, damped harmonic oscillator | 8 | 09-Oct to 5-Nov | Derivations and  Numericals  Discussion of  Important questions  Home Register Checking |
| **Unit 4: Gravitation:**  Newton’s Law of Gravitation, Motion of a particle in a central force field, Kepler’s  Laws (statements only) | 3 | 06-Nov to 14-November | Derivations and  Numericals |
| **Unit 5: Special Theory of Relativity:**  Frames of reference, Galilean transformations, inertial and non-inertial frames,  Michelson Morley’s Experiment, postulates of special theory of relativity, length  contraction, time dilation, relativistic transformation of velocity, relativistic variation  of mass. | 8 | 15 November to 24 December | Derivation, Numericals & Revision. Solving previous year Question papers. |