Course outcomes:

On successful completion of this course, the students will be able to:

 Understand the Newton's laws of motion and the law of conservation of linear momentum and its application to rocket motion, the concepts of concepts of impact parameter, scattering cross section and Distinguish between elastic and inelastic collisions.
 Formulate the rotational kinematic relations, learn the working principle of gyroscope and its applications and explain the precessional motion of a freely rotating symmetric top.
 Analyse the general characteristics of central forces and the application of Kepler's laws to describe the motion of planets and satellite in circular orbit through the study of law of Gravitation.
 State the postulates of Special theory of relativity and its consequences such as length contraction, time dilation, relativistic mass and mass-energy equivalence.
 Understand the phenomena of simple harmonic motionand the distinction between undamped, damped and forced oscillations and the concepts of resonance and quality factor with reference to damped harmonic oscillator.
 State the laws of transverse vibrations in a stretched string and their verification using a
sonometer and learn the formation of harmonics and overtones in a stretched string.
 Acquire knowledge onUltrasonic waves, their production and detection and their applications in different fields.

Practical Course 1: Mechanics, Waves and Oscillations

Work load: 30 hrs per semester 2 hrs/week
Course outcomes (Practicals):

On successful completion of this practical course,the student will be able to;
 perform experiments on Properties of matter such as the determination of moduli of elasticity viz., Young's modulus, Rigidity modulus of certain materials; Surface tension of water , Coefficient of viscosity of a liquid , Moment of inertia of some regular bodies by different methods and compare the experimental values with the standard values.
 determine the acceleration due to gravity at a place using Compound pendulum and Simple pendulum.
 notice the difference between flat resonance and sharp resonance in case of volume

resonator and sonometer experiments respectively.

 verify the laws of transverse vibrations in a stretched string using sonometer and comment on the relation between frequency, length and tension of a stretched string under vibration.

 demonstrate the formation of stationary waves on a string in Melde's string experiment.

Course outcomes:

On successful completion of this course, the student will be able to:

 Explain about the different aberrations in lenses and discuss the methods of minimizing them.

 Understand the phenomenon of interference of light and its formation in Lloyd's single mirror Thin films and Newton's rings.

 Distinguish between Fresnel's diffraction and Fraunhoffer diffraction and observe the diffraction patterns in the case of single slit and the diffraction grating.

 Describe the construction and working of zone plate and make the comparison of zone plate with convex lens.

 Explain the various methods of production of plane, circularly and polarized light and their detection and the concept of optical activity.

 Comprehend the basic principles of laser and fibre optic communication and their applications.

Practical Course II: Wave Optics

Work load: 30 hrs 2 hrs/week

On successful completion of this practical course,the student will be able to;

1. gain hands-on experience of using various optical instruments like spectrometer, polarimeter and making finer measurements of wavelength of light using Newton Rings experiment, diffraction grating etc.
2. understand the principle of working of polarimeter and the measurement of specific rotatory power of sugar solution
3. know the techniques involved in measuring the resolving power of telescope and dispersive power of the material of the prism.
4. be familiar with the determination of refractive index of liquid by Boy's method and the determination of thickness of a thin wire by wedge method.