Course Outcomes

I Semester:

Course Name	Course Credits	Course Outcomes
Course I ***Mechanics, Waves and Oscillations*** **Unit I :** ➢ **Mechanics of Particles** ➢ **Mechanics of Rigid bodies** **Unit II:** ➢ **Motion in a Central Force Field** **Unit III:** ➢ **Relativistic Mechanics** **Unit IV:** ➢ **Undamped, Damped and Forced oscillations** ➢ **Coupled oscillations:** **Unit V:** ➢ **Coupled oscillations** ➢ **Ultrasonics**	***Theory:04*** ***Practicals:01***	***After the successful completion of the course, the students will be able to:*** ➢ Understand Newton's laws of motion and motion of variable mass system and its application to rocket motion and the concepts of impact parameter, scattering cross section. ➢ Apply the rotational kinematic relations, the principle and working of gyroscope and its applications and the precessional motion of a freely rotating symmetric top. ➢ Comprehend 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. ➢ Examine phenomena of simple harmonic motion and the distinction between undamped, damped and forced oscillations and the concepts of resonance and quality factor with reference to damped harmonic oscillator. ➢ Appreciate the formulation of the problem of coupled oscillations and solve them to obtain normal modes of oscillation and their frequencies in simple mechanical systems.

II Semester:

Course Name	Course Credits	Course Outcomes
Course II ***Wave Optics*** **Unit I :** ➢ **Interference of light** **Unit II:** ➢ **Diffraction of light** **Unit III:** ➢ **Polarisation of light:** **Unit IV:** ➢ **Aberrations and Fibre Optics** **Unit V:** ➢ **Lasers and Holography**	***Theory:04*** ***Practicals:01***	***After the successful completion of the course, the students will be able to:*** ➢ Understand Newton's laws of motion and motion of variable mass system and its application to rocket motion and the concepts of impact parameter, scattering cross section. ➢ Apply the rotational kinematic relations, the principle and working of gyroscope and its applications and the precessional motion of a freely rotating symmetric top. ➢ Comprehend 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. ➢ Examine phenomena of simple harmonic motion and the distinction between undamped, damped and forced oscillations and the concepts of resonance and quality factor with reference to damped harmonic oscillator. ➢ Appreciate the formulation of the problem of coupled oscillations and solve them to obtain normal modes of oscillation and their frequencies in simple mechanical systems.

III Semester:

Course Name	Course Credits	Course Outcomes
Course-III: ***Heat And Thermodynamics*** **Unit I :** ➢ **Kinetic Theory of gases** **Unit II:** ➢ **Thermodynamics** **Unit III:** ➢ **Thermodynamic Potentials and Maxwell's equations** **Unit IV:** ➢ **Low temperature Physics** **Unit V:** ➢ **Quantum theory of radiation**	***Theory:04*** ***Practicals:01***	***After the successful completion of the course, the students will be able to:*** ➢ Understand the basic aspects of kinetic theory of gases, Maxwell-Boltzman distribution law, equipartition of energies, mean free path of molecular collisions and the transport phenomenon in ideal gases. ➢ Gain knowledge on the basic concepts of thermodynamics, the first and the second law of thermodynamics, the basic principles of refrigeration,the concept of entropy, the thermodynamic potentials and their physical interpretations. ➢ Understand the working of Carnot's ideal heat engine, Carnot cycle and its efficiency. ➢ Develop critical understanding of concept of Thermodynamic potentials,the formulation of Maxwell's equations and its applications. ➢ Differentiate between principles and methods to produce low temperature and liquefy air and also understand the practical applications of substances at low temperatures ➢ Examine the nature of black body radiations and the basic theories.

IV Semester:

Course Name	Course Credits	Course Outcomes
Course-IV: ***Electricity, Magnetism & Electronics*** ***Unit I :*** ➢ **Electrostatics** ➢ **Dielectrics** ***Unit II:*** ➢ **Magnetostatics** ➢ **Electromagnetic Induction** ***Unit III:*** ➢ **Alternating currents** ➢ **Electromagnetic waves-Maxwell's equations** ***Unit IV:*** ➢ **Basic Electronic devices:** ***Unit V:*** ➢ **Digital Electronics**	***Theory:04*** ***Practicals:01***	***After the successful completion of the course, the students will be able to:*** ➢ Understand the Gauss law and its application to obtain electric field in different cases and formulate the relationship between electric displacement vector, electric polarization, Susceptibility, Permittivity and Dielectric constant. ➢ Distinguish between the magnetic effect of electric current and electromagnetic induction and apply the related laws in appropriate circumstances. ➢ Understand Biot and Savart's law and Ampere's circuital law to describe and explain the generation of magnetic fields by electrical currents. ➢ Develop an understanding on the unification of electric and magnetic fields and Maxwell's equations governing electromagnetic waves. ➢ Phenomenon of resonance in LCR AC-circuits, sharpness of resonance, Q -factor, Power factor and the comparative study of series and parallel resonant circuits. ➢ Describe the operation of p-n junction diodes, zener diodes, light emitting diodes and transistors ➢ Understand the operation of basic logic gates and universal gates and their truth tables.

IV Semester:

Course Name	Course Credits	Course Outcomes
Course-V: ***Modern Physics*** ***Unit I :*** ➢ **Atomic and Molecular Physics** ***Unit II:*** ➢ **Matter waves&Uncertainty Principle** ***Unit III:*** ➢ **Quantum (Wave) Mechanics** ***Unit IV:*** ➢ **Nuclear Physics** ***Unit V:*** ➢ **Nano materials**	***Theory:04*** ***Practicals:01***	***After the successful completion of the course, the students will be able to:*** ➢ Develop an understanding on the concepts of Atomic and Modern Physics, basic elementary quantum mechanics and nuclear physics. ➢ Develop critical understanding of concept of Matter waves and Uncertainty principle. ➢ Get familiarized with the principles of quantum mechanics and the formulation of Schrodinger wave equation and its applications. ➢ Examine the basic properties of nuclei, characteristics of Nuclear forces, salient features of Nuclear models and different nuclear radiation detectors. ➢ Classify Elementary particles based on their mass, charge, spin, half life and interaction. ➢ Get familiarized with the nano materials, their unique properties and applications. ➢ Increase the awareness and appreciation of superconductors and their practical applications.

V Semester:

Course Name	Course Credits	Course Outcomes
SEC(6B): ***Low Temperature Physics & Refrigeration*** ***Unit I :*** ➢ **PRODUCTION OF LOW TEMPERATURE** ***Unit II:*** ➢ **MEASUREMENT OF LOW TEMPERATURE** ***Unit III:*** ➢ **PRINCIPLES OF REFRIGERATION** ***Unit IV:*** ➢ **COMPONENTS OF REFIGERATOR** ***Unit V:*** ➢ **APPLICATIONS OF LOW TEMPERATURE & REFRIGERATION**	***Theory:03*** ***Practicals:02***	***After the successful completion of the course, the students will be able to:*** ➢ Identify various methods and techniques used to produce low temperatures in the Laboratory. ➢ Acquire a critical knowledge on refrigeration and air conditioning. ➢ Demonstrate skills of Refrigerators through hands on experience and learns about refrigeration components and their accessories. ➢ Understand the classification, properties of refrigerants and their effects on environment. ➢ Comprehend the applications of Low Temperature Physics and refrigeration.

V Semester:

Course Name	Course Credits	Course Outcomes
SEC(7B): ***Solar Energy and Applications*** ***Unit I :*** ➢ **BASIC CONCEPTS OF SOLAR ENERGY** ***Unit II:*** ➢ **SOLAR THERMAL COLLECTORS** ***Unit III:*** ➢ **FUNDAMENTALS OF SOLAR CELLS** ***Unit IV:*** ➢ **TYPES OF SOLARCELLS AND MODULES** ***Unit V:*** ➢ **ENERGY STORAGE SYSTEMS**	***Theory:03*** ***Practicals:02***	***After the successful completion of the course, the students will be able to:*** ➢ Understand Sun structure, forms of energy coming from the Sun and its measurement. ➢ Acquire a critical knowledge on the working of thermal and photovoltaic collectors. ➢ Demonstrate skills related to callus culture through hands on experience. ➢ Understand testing procedures and fault analysis of thermal collectors and PV modules. ➢ Comprehend applications of thermal collectors and PV modules.