

PHYSICS - COURSE OUTCOMES(COS)

Course Code: PHY1SK

Course Name: Mechanics, Waves & Oscillations

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

CO 1	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.
CO 2	Apply the rotational kinematic relations, the principle and working of gyroscope and its applications and the precessional motion of a freely rotating symmetric top.
CO 3	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.
CO 4	Understand postulates of Special theory of relativity and consequences such as length contraction, time dilation, relativistic mass and mass-energy equivalence.
CO 5	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.

Course Code: **PHY2SK**Course

Name: **Wave optics**

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

CO 1	Understand the phenomenon of interference of light and its formation in (i) Lloyd's single mirror due to division of wave front and (ii) Thin films, Newton's rings and Michelson interferometer due to division of amplitude
CO 2	Distinguish between Fresnel's diffraction and Fraunhofer diffraction and observe the diffraction patterns in the case of single slit and the diffraction grating.
CO 3	Describe the construction and working of zone plate and make the comparison of zone plate with convex lens.
CO 4	Explain the various methods of production of plane, circularly and polarized light and their detection and the concept of optical activity.
CO 5	Comprehend the basic principle of laser, the working of He-Ne laser and Ruby lasers and their applications in different fields.

Course Code: **PHY3SK**
Course Name: **Heat & Thermodynamics**

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

CO 1	Understand the basic aspects of kinetic theory of gases, Maxwell-Boltzmann distribution law, equipartition of energies, mean-free path of molecular collisions and the transport phenomenon in ideal gases
CO 2	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.
CO 3	Understand the working of Carnot's ideal heat engine, Carnot cycle and its efficiency
CO 4	Develop critical understanding of concept of Thermodynamic potentials, the formulation of Maxwell's equations and its applications.
CO 5	Differentiate between principles and methods to produce low temperature and liquefy air and also understand the practical applications of substances at low temperatures.

Course Code: **PHY4SKA**

Course Name: **Electricity, Magnetism & Electronics**

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

CO 1	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.
CO 2	Distinguish between the magnetic effect of electric current and electromagnetic induction and apply the related laws in appropriate circumstances.
CO 3	Understand Biot and Savart's law and Ampere's circuital law to describe and explain the generation of magnetic fields by electrical currents.
CO 4	Develop an understanding on the unification of electric and magnetic fields and Maxwell's equations governing electromagnetic waves.
CO 5	Phenomenon of resonance in LCR AC-circuits, sharpness of resonance, Q-factor, Power factor and the comparative study of series and parallel resonant circuits.

Course Code: **PHY4SKB**
Course Name: **Modern Physics**

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

CO 1	Develop an understanding on the concepts of Atomic and Modern Physics, basic elementary quantum mechanics and nuclear physics.
CO 2	Develop critical understanding of concept of Matter waves and Uncertainty principle.
CO 3	Get familiarized with the principles of quantum mechanics and the formulation of Schrodinger wave equation and its applications.
CO 4	Examine the basic properties of nuclei, characteristics of nuclear forces, salient features of nuclear models and different nuclear radiation detectors.
CO 5	Classify Elementary particles based on their mass, charge, spin, half-life and interaction.

Course Code: **PHY5SCA**
Course Name: **Electricity, Magnetism & Electronics**

Upon completion of this course the student will be able to:

CO 1	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, Per activity and Dielectric constant.
CO 2	Distinguish between the magnetic effect of electric current and electromagnetic induction and apply the related laws in appropriate circumstances.
CO 3	Understand Biota and Savart's law and Ampere's circuital law to describe and explain the generation of magnetic fields by electrical currents.
CO 4	Develop an understanding on the unification of electric and magnetic fields and Maxwell's equations governing electro-magnetic waves.
CO 5	Phenomenon of resonance in LCR AC-circuits, sharpness of resonance, Factor, Power factor and the comparative study of seriesand parallel resonant circuits.

Course Code: **PHY5SCB**
Course Name: **Modern Physics**

Upon completion of this course the student will be able to:

CO 1	Develop an understanding on the concepts of Atomic and Modern Physics, basic elementary quantum mechanics and nuclear physics.
CO 2	Develop critical understanding of concept of Matter waves and Uncertainty principle.
CO 3	Get familiarized with the principles of quantum mechanics and the formulation of Schrodinger wave equation and its applications.
CO 4	Examine the basic properties of nuclei, characteristics of nuclear forces, salient features of nuclear models and different nuclear radiation detectors.
CO 5	Classify Elementary particles based on their mass, charge, spin, half-life and interaction.

Course Code: **PHY6SC**
Course Name: **Renewable Energy (Elective)**

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

CO 1	The learner will be able to describe the environmental aspects of non-conventional energy sources, in comparison with various conventional energy sources.
CO 2	Tell the need of renewable energy sources.
CO 3	Describe the use of solar energy in various applications like solar heating, cooling, desalination, drying, cooking and power generation.
CO 4	Explain the applications of wind energy using wind turbines. Describe the advantages and disadvantages of Ocean energy.
CO 5	Explain the applications of Bio gas plants.

Course Code: **PHY6SC1**
Course Name: **Solar Thermal & Photovoltaic Aspects (Cluster-C1)**

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

CO 1	The learner will be able to describe the solar intensity measurement using Angstrom's Pyrheliometer.
CO 2	Describe the construction, working and efficiencies of different solar collectors.
CO 3	Explain the efficiency, fill factor of a solar cell.
CO 4	Analyze the working of Solar PV system.
CO 5	Differentiate various thermal applications of solar energy like solar heaters, coolers, dryers, desalinators, cookers, power generators.

Course Code: **PHY6SC2**
Course Name: **Wind, Hydro and Ocean energies (Cluster-C2)**

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

CO 1	The student can Identify Winds energy as alternate form of energy and to know how it can be tapped.
CO 2	Explain about the various wind energy conversion systems
CO 3	Student can able to know various Wind energy applications
CO 4	Understand the Ocean thermal, Wave & Tidal energy, its mechanism of production and its applications
CO 5	Distinguish the micro, mini and small hydro power systems.

Course Code: **PHY6SC3**
Course Name: **Energy Storage devices (Cluster-C3)**

Upon completion of this course the student will be able to:

CO 1	Student able to know about need of energy Storage
CO 2	The student can able to differentiate the primary, secondary batteries.
CO 3	Explain the various applications of SMES systems, and their performance.
CO 4	Discuss the construction and working principle of Fuel Cell and differentiate the different types of fuel cells.
CO 5	Describe the various applications of Fuel Cells.