# *THE LEARNING OUTCOME FRAME OF UG COURSE OF PHYSICS*

## [2] PSOs of B.Sc. Physics

PSO1 Describe the methodology of science and the relationship between observations and theory.

PSO2 Apply conceptual understanding of physics to general real world situations

PSO3 Understanding the basic concepts of mechanics and thermodynamics to explain the working principles of machines & engines. Preparing foundations for classical as well as quantum systems, statistically.

PSO4 Acquiring the knowledge of optical phenomena & instruments, LASER, electric and magnetic fields in static and dynamic situations.

PSO5 Understanding quantum mechanical tools to learn about the realm of atomic dimensions, principle of spectroscopy for determining the characteristics of various elements and solid state physics & electronics.

PSO6 To develop problem solving skill.

PSO7 To develop skill on experimentation for proper handling of apparatus.

## 2.1 COs of the Course 'Mathematical Physics, Mechanics and properties of Matter''

CO1 Understanding the basics of mathematics to explain the various physical laws and to provide theoretical background.

CO2 Understanding the basic concepts of Newtonian mechanics: elasticity, surface tension, viscosity, oscillations and motion of rigid bodies, along with their applications.

CO3 Studying basic principles of relativity and the relativistic relations.

CO4 Performing various laboratory experiment related to the course content.

## 2.2 COs of the Course 'thermodynamics and statistical physics'

CO1 Learning the basic laws of thermodynamics and its applications.

CO2 Understanding the concept of entropy and its variation in different thermodynamical processes. Studying the Maxwell thermodynamical relations.

CO3 Learning the probability theory.

CO4 Understanding foundations of statistical mechanics and its association with thermodynamics to evaluate macroscopic thermal properties of materials. Calculating various distribution functions i. e. Maxwell-Boltzmann, Bose-Einstein and Fermi-Dirac statistics and their applications.

CO5 Performing experiments as per course content.

## 3 COs of the Course 'Optics'

CO1 Learning the basic principles of geometrical optics, image formation and working of optical instruments.

CO2 Introduction to interference, interferometers and their applications in determination of wavelength and spectral widths.

CO3 Studying diffraction, related properties and instruments.

CO4 Learning the concept of polarization and related instruments.

CO5 Understanding theoretical and practical aspects of lasers.

CO6 Performing experiments to understand the principles of optics by using various optical instruments, laser.

## 4 COs of the Course 'Electrostatics, Magnetostatics & Electrodynamics'

CO1 Learning the basics of electrostatics- Coulomb's law & its applications, concept of capacitors and relations between **D**, **E** and **P**.

CO2 Understanding the basic concepts of magnetostatics- Biot Savart's law, Ampere law and the relationship between **B**, **H** and **M**.

CO3 Studying the growth and decay of current in LCR circuits and determination of their time constants.

CO4 Learning the laws of electromagnetic theory, Maxwell's equations, and propagation of electromagnetic waves in diverse media.

CO5 Developing skill to solve numerical problems.

CO6 Performing laboratory experiments based on the above concepts.

## 5 COs of the Course 'Quantum Mechanics and Spectroscopy'

CO1 The need and basic postulates of quantum mechanics.

CO2 Application of Schrodinger wave equation to solve different problems.

CO3 Studying the atomic spectra for hydrogen atom and X-rays.

CO4 Understanding molecular spectra – electronic, vibrational and rotational spectra and their application to analyze the different types of molecules.

CO5 Describing basic properties of nucleus & its stability, nuclear radiations, Reactions, models and finally the concepts of nuclear fission & fusion.

## 6 COs of the Course 'Solid State Physics and Devices'

CO1 Studying the crystal structure and band theory for solids.

CO2 Studying the thermal & electrical properties of solids – thermal and electrical conductivity, resistivity and specific heat.

CO3 Understanding the occurrence of magnetism in solids and theoretical explanation provided by quantum and classical theories.

CO4 Study of semiconductors and their applications in electronic devices: Zener diode, Photo diode, LED, Solar cell, Transistor, JFET, Amplifiers in CB, CE, CC configurations ( Class A, B, C amplifiers), RC-coupled amplifiers, Feedback amplifiers, Oscillators.

CO5 Understanding the need for modulations /demodulations and their types.

CO6 Understanding essential differences in structures and properties of bulk and Nano materials. Synthesis of nanoparticles using chemical and physical methods and nanolithography.

CO7 Performing laboratory experiments on the above devices.