Course Outcome (CO)
B.Sc. (PHYSICS) Part I
2022-23

Paper - I	: MECHANICS
Paper - II	: ELECTRICITY & MAGNETISM
Paper - III	: Practical
Paper - IV	: Practical

Paper - I : MECHANICS

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

- Get knowledge about vectors and different equations used in Physics,
- Get an idea of different types of motions and observation laws,
- Get an idea about rotational motion and various properties of matter like elasticity and viscosity,
- Understand various types of oscillatory motion and GPS systems,
- Get an idea about Frames of reference and the special theory of relativity,
- Solve numerical problems based on the entire syllabus.

Paper - II : ELECTRICITY AND MAGNETISM

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

- Get knowledge about vector analysis and be able to apply it in electrostatic and magnetostatics,
- Get an idea about electric fields, forces and potential,
- Get an idea about Dielectric and electric currents and their application in AC circuits,
- Get an idea about the Magnetic properties of the material,
- To get an idea about Electromagnetic Induction Maxwell's equation and Electromagnetic wave propagation,
- Solve numerical problems based on the entire syllabus.

Paper - III and IV : LAB 1: MECHANICS, ELECTRICITY AND MAGNETISM

After successful completion of this course students will be able to:

- To get knowledge about the use of various measuring instruments,
- To get an understanding of the simple harmonic motion, elasticity, surface tension and viscosity,
- Students will be able to understand applications of the basic principle of electricity and Magnetism theory in the real world.

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B.Sc. (PHYSICS) Part II

Paper - I	: Thermodynamics, Kinetic Theory and Statistical Physics
Paper - II	: Waves, Acoustics and Optics
Paper - III	: Practical
Paper - IV	: Practical

Paper - I : Thermodynamics, Kinetic Theory and Statistical Physics

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

- Understand the laws of thermodynamics, Carnot's cycle, the concept of entropy and the change of entropy in and negative temperature.
- Understand the thermodynamic functions, Maxwell's thermodynamic equations and their applications, TdS equations, Black body spectrum and its analysis, Quantum theory of radiation;
- Learn the Maxwellian distribution of speeds in an ideal gas, Doppler broadening, Transport phenomena in gases, mean free path, behaviour or real gases,
- Understand the statistical basis of thermodynamics, Gibbs ensemble, accessible and inaccessible states, equilibrium conditions, Boltzmann, canonical distribution law and applications transition to quantum statistics;
- Understand the indistinguishability of particles and their consequences, Bose-Einstein, Fermi-Dirac, Maxwell-Boltzmann statistics and their applications.

Paper - II : Waves, Acoustics And Optics

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

- Understand waves in media, waves over the liquid surface, group and phase velocity, production and uses of Ultrasonic and Infrasonic waves, Reflection, refraction and diffraction of sound, Sonar,
- Use of Fermat's principle in understanding reflection, and refraction and to derive various formulas in plane as well as curved surfaces using geometrical methods, Aberrations and their reductions, Optical instruments and the need for an eyepiece.
- Understand the interference of light, Newton's rings, Michelson interferometer and their application to determine the precise wavelength, and other interferometers;
- Understand the diffraction, phasor diagram and integral calculus methods, Diffraction in different conditions, resolving power of grating, prism and telescope, Concept and production of Polarized light and its mathematical representation;
- Learn the Laser system and basic properties of laser action, Einstein's A and B coefficient, emission mechanisms, Types and applications of laser in various fields.

Paper - III and IV : Practical

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

- Practically verify thermal laws, and different optical principles, and study fringe patterns.

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B.Sc. (PHYSICS) Part III

Paper - I	: Relativity, Quantum Mechanics, Atomic, Molecular And Nuclear Physics
Paper - II	: Solid State Physics, Solid State Devices And Electronics
Paper - III	: Practical
Paper - IV	: Practical

Paper - I   : Relativity, Quantum Mechanics, Atomic, Molecular And Nuclear Physics

After successful completion of this course the student will be able to

- Understand the reference systems, special theory of relativity, transformations, mass-energy equivalence,
- Learn about the Origin of the quantum theory by explaining the failure of classical physics in various phenomena,
- Understand Schrodinger's equation, wave function, Orthogonality and normalization,
- Learn Spectral analysis, transition rules vibration and electronic vibration spectra,
- Understand the Structure and Basic Properties of Nuclei and the Classification of Elementary Particles.

Paper - II   : Solid State Physics, Solid State Devices And Electronics

After successful completion of this course the student will be able to

- Understand the types of crystal structures, their basic properties, theories of Specific heat of solids, Vibrational modes,
- Understand the Free electron model of metal, Density of states, Fermi Energy, Energy bands, Hall effect, Dia, Para and Ferromagnetism, B-H curve etc.
- Understand the types of semiconductors, Concept of Fermi level, Mobility of electrons and holes, junction diodes and their characteristics, Transistors and their characteristics, FET, and MOSFET.
- Understand the different types, features and factors related to the respective rectifiers, h-parameters and their equivalent circuits, Transistor as power amplifiers and oscillators, types of oscillators,
- Understand the Analog and Digital Circuits, number systems, various logic gates, their realization using Diodes and Transistors, De Morgan's Theorems, Boolean Laws, Simplification of Logic Circuits, D/A and A/D converters.

Paper - III and IV   : Practical

After successful completion of this course the student will be able to

- Practically verify classical experiments which had established the fundamental values of various constants,
- Analyze the spectrum using grating.
- Study semiconductor properties and characteristics of various devices.
- Study circuits with active and passive components.