

B.Sc. (Physics)

Program Specific Outcomes:

After successful completion of three year graduate level degree program in Physics a student should be able to;

- Understand the core theories and principles of Physics.
- Learn the concepts of Physics through classical and quantum phenomena.
- Think methodically, independently and draw a logical conclusion of scientific problem.
- Use basic mathematics to describe and analyze physical phenomena.
- Enhance the learning abilities through development of simple laboratory experiments.
- Develop the practical skills and techniques to tackle the scientific problems.

Course Outcomes:

After successful completion of relevant course in Physics a student should be able to attain following outcomes;

B.Sc.I/Semester I/Mechanics I (DSC-1-A)

- Knowledge and applications of vector algebra in Physics.
- Understanding of basic ordinary differential equations.
- Concept of Newton's laws of motion and their applications.
- Basic concept of rotational motion.

B.Sc.I/Semester I/Mechanics II (DSC-2-A)

- Understand law of Gravitation.
- Use of Satellite in Global Positioning System (GPS).
- Concept of elasticity and its use in day to day life.
- Differentiation of hydrophilic and hydrophobic surfaces.

B.Sc.I/Semester II/Electricity Magnetism I (DSC-1-B)

- Knowledge and applications of vector calculus in Physics.
- Understanding of vector integrals.
- Conceptual clarity of electrostatics.
- Concept of polarization in dielectrics.

B.Sc.I/Semester II/Electricity Magnetism II (DSC-2-B)

- Qualitative analysis of AC circuits.
- Magnetism and magnetostatics.
- Concept of electromagnetic induction.
- Idea of Maxwell's equations of electromagnetic waves.

B.Sc.II/Semester III/ Thermal Physics and Statistical Mechanics-I (DSC-1-C)

- Highlight of different velocities of gas molecules.
- Knowledge of Maxwell's distribution of gas molecules.
- Merits and drawbacks of thermometers.
- Basic thermodynamic processes and application to heat engine.

B.Sc.II/Semester III/ Waves and Optics –I (DSC-2-C)

- Knowledge of superposition of harmonic oscillators.
- Theory of coupled oscillations.
- Understanding the ultrasonic waves and their applications.
- Basics of sound in context of acoustics of buildings.

B.Sc.II/Semester IV/ Thermal Physics and Statistical Mechanics-II (DSC-1-D)

- Conceptual clarity of thermodynamic functions and Clausius-Clapeyron equation.
- Understanding the black body radiation spectrum.
- Planck's law of radiation.
- Preliminary knowledge of classical and quantum statistical mechanics.

B.Sc.II/Semester IV/ Waves and Optics –II (DSC-2-D)

- Cardinal points and their graphical representation.
- Rayleigh criterion and resolving power of prism and grating.
- Qualitative study of polarization of light.
- Study of interference for determination of wavelength of light.

B.Sc.III/Semester V/ Mathematical and Statistical Physics (Paper IX)

- Curvilinear coordinates and coordinate systems.
- Understanding of basic partial differential equations.
- Basic concepts in statistical mechanics
- Idea of classical and quantum statistical mechanics.

B.Sc.III/Semester V/ Quantum Mechanics (Paper X)

- Study motion of particles in one and three dimensions
- Study quantum mechanical behavior of the particle
- Differentiation between Classical and Quantum mechanics
- Study different operators in quantum mechanics

B.Sc.III/Semester V/ Classical Mechanics (Paper XI)

- Understanding conservation laws of mechanics of system of particles.
- Lagrange's equations and their applications.
- Hamilton's principle and techniques of calculus of variation
- Understanding the rigid body dynamics.

B.Sc.III/Semester V/Atomic & Molecular Spectra, Astronomy & Astrophysics (Paper XII)

- Optical spectral lines: selection and intensity rules.
- Understanding doublet fine structure.
- Concept of Raman Effect.
- Milky Way Galaxy and Solar system.

B.Sc.III/Semester VI/Nuclear and Particle Physics (Paper XIII)

- Construction and working of different types of nuclear accelerators.
- Construction and working of different types of nuclear detectors.
- Understanding basic nuclear reactions and models.
- Introductory elementary particles.

B.Sc.III/Semester VI/Energy Studies and Material science (Paper XIV)

- Knowledge on different types of renewable energy resources.
- Study of wind energy and its generation by wind turbine.
- Study of solar energy and its generation by solar panel.
- Synthesis of nanoparticles.

B.Sc.III/Semester VI/ Electrodynamics and Electromagnetic Waves (Paper XV)

- Motion of charged particles in fields.
- Understanding the basic laws in electrostatics and magnetostatics.
- Deriving the Maxwell's equations of electromagnetic waves.
- Propagation of electromagnetic waves in free space.

B.Sc.III/Semester VI/ Solid State Physics (Paper XVI)

- Models of different crystal structures
- Analysis of X-ray diffraction patterns
- Applications of IC-555 as different multivibrators
- Difference between metals, semiconductors and insulators