

Department of Physics

Programme Name - B.Sc. (Physics)

Programme Outcomes

Knowledge Outcomes

After completing B.Sc. (Physics) Programme students will be able to:

1. Apply the basic principles of Physics to the events occurring around us and also in the world.
2. Try to find out or analyze scientific reasoning for various things.

Skill Outcomes

After completing B.Sc. (Physics) Programme students will be able to:

1. Use computers and various software and acquire programming skills
2. apply the knowledge to develop the sustainable and eco-friendly technology for pollution free environment
3. collaborate effectively on team-oriented projects in the field of Physics
4. Communicate scientific information in a clear and concise manner both orally and in writing or through audio video presentations

Generic outcomes

Students will

1. develop ability to work in group
2. develop capacity of critical reasoning, judgment and communication skills.
3. Develop abilities for logical thinking

Programme Specific Outcomes

PSO1: Students get acquainted with techniques which are useful in industry.

PSO2: Students get conceptual knowledge of entrepreneurship through the co-curricular activities

PSO3: learn the organizational skills and working in group.

PSO4: Students will be well versed with use of computers

Course outcomes

In each course students will learn different concepts and theories as mentioned below.

First Year (Autonomous)

Semester I

Course- 22-PHY 111- Mechanics and Properties of Matter

CO1: Application of Newton's laws of motion to solve various problems related to day today life.

CO2: Concepts like zero work done, conservative forces, mass energy equivalence ($E= mc^2$).

CO3: Effect of force on various types of materials is described and physical properties like elasticity, different moduli etc. along with their relation.

CO4: Examples of surface tension in nature and its applications in our day to day life.

CO5: Concept of viscosity of fluids, Bernoulli's Equation and its applications.

Course- 22-PHY 112- Physics Principles and Applications

CO1: Students learn about an atom is made up of protons, neutrons and electron, how they arranged to make up an atom. They learn different atomic models, Atomic spectrum and types of spectrum.

CO2: Students learn about Different forces which hold atoms together to form a molecule.

Different types of chemical and physical bonds like ionic, covalent, Van der Waal's bonds. Energy levels of rotational and vibrational diatomic molecule.

CO3: Students will identify and compare the characteristics of electromagnetic spectrum including speed, wavelength and frequency.

CO4: students will learn common uses and applications of electromagnetic waves.

CO5: students will learn basic principles of Laser, excitation and de-excitation process, pumping scheme, population inversion and metastable state. Characteristics, applications and different types of lasers.

Semester II

Course – 22-PHY-121- Heat and Thermodynamics

CO1: To understand various thermodynamic processes like isothermal, isobaric, isochoric processes and laws of thermodynamics.

CO2: To understand the concept of entropy.

CO3: To understand Carnot's cycle, Heat engines and Refrigerators.

CO4: To understand Principle of thermometry and various types of thermometers like Liquid filled thermometers, Gas filled thermometers, Bimetallic thermometers, Platinum resistance thermometer

Course – 22-PHY122 - Electricity and Magnetism

CO1: Students will be able to understand the concept of the electric force, electric field and electric potential for stationary charges. They are able to calculate electric potential and electric field by using Gauss's law.

CO2: Student will understand the dielectric phenomenon and effect of electric field on dielectric.

CO3: Study the concept of magnetic field, magnetic field for steady currents using Biot-Savart's and Ampere's Circuital laws.

CO4: Student will learn magnetic materials and its properties.

Second Year (2019 CBCS Pattern)

Semester I

Course: PHY 231 Mathematical Methods in Physics

Students learn about the following topics in this subject

CO1: Studying De Moivre's theorem students will understand how the power of given complex number is calculated.

CO2: Many times students come across the term divergence, curl, gradient but they don't understand their physical meaning. From this course their concept will clear.

CO3: Students can understand what exact use of partial differentiation concept in physics is. .

CO4: Students can also understand what the need of complex no. is during mathematical calculation

Course: PHY 232 (A) Electronics I

Students learn about the following topics in this subject

CO1: Various network theorems which use to solve problems related to complicated circuits by converting them into simpler circuits. This has wide applications in electronic and transmission circuits.

CO2: Knowledge about semiconductors since it is a basic materials used in many electronic components like diode, transistors FET, UJT etc.

CO3: Characteristics and working of operational amplifiers which are useful in various medical and scientific investigations to amplify the signals.

CO4: Generation of high frequency signals using oscillator circuits and their applications in radio and TV communication.

CO5: An introduction to digital electronics which is useful in digital computers. Also logic gates and their applications.

Course: PHY 232 (B) Instrumentation

Students learn about the following topics in this subject

CO1: History and need of Instrumentation, Components of measurement system, Standards of Measurement, errors in measurement. Importance and methods of calibration. Static and dynamic characteristics of measurements.

CO2: Transduction principle, types of transducers. Use of transducers in measurement of displacement, force and temperature.

CO3: Comparative study of Pressure scales, pressure units, concept of vacuum, Elastic Transducers, Types and use of diaphragms and strain gauges.

CO4: Need and use of signal conditioning. Circuits indicating use of OPAMP for different applications. Like current to voltage converter, voltage to current converter and filters.

Semester II

Course: PHY 241 Waves and Oscillations

Students learn about the following topics in this subject

CO1: Studying DeMoivre's theorem students will understand how the power of given complex number is calculated.

CO2: Many times, students come across the term divergence, curl, gradient but they don't understand their physical meaning. From this course their concept will clear.

CO3: Students can understand what exact use of partial differentiation concept in physics is.

CO4: Students can also understand what the need of complex no. is during mathematical calculation.

Course: PHY 242 Optics

Students learn about the following topics in this subject

CO1: Geometrical optics dealing with lenses and mirrors and image formation

CO2: Defects produced in images formed by lenses like distortion, spherical aberration, Coma, Astigmatism and ways to reduce these defects

CO 3: Construction working and image formation by simple microscope, compound microscope, Huygen's eyepiece and Ramsden Eyepiece

CO 4: Theory of Fringes formed in Interference and diffraction, Formation of Fringes using Newton's ring experiment, resolving power and comparison between Fresnel and Fraunhofer diffraction

CO 5: Concept of polarization, double refraction, Nicol Prism