

**Department of Physics
Bal Ganga Degree College Sendul
(Kemar)**

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 of computers and various software and programming skills
2. Apply the knowledge to develop the sustainable and eco-friendly technology for pollutionfree 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 (CBCS) PATTERN

Semester I

Course- PHY-241111-DSC- 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.

CO 5: Many times students come across the terms like divergence, curl and gradient but they don't understand their physical significance. From this course they will learn the concepts to a depth.

CO 6: Students can understand the use of the concept of partial differentiation in solving Physics situations which have more than one variable.

Semester II

Course- PHY-242111-DSC- 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

Semester III

Course - PHY-243111-DSC- Thermal physics and Statistical Mechanics

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.

CO5: To learn about thermodynamic functions, variables and their relations.

CO6: To acquire the skill of solving problems based of particle distribution.

CO7: To study about types of ensembles viz. Microcanonical, canonical and grand canonical.

Semester IV

Course-PHY-244111- DSC-Waves and Optics

CO1: Learn how a body oscillates without damping amplitude and what the necessary conditions are for it.

CO2: Learn how we can set any object in the forced oscillations that is in continuous motion

CO3: doppler Effect and its use in in day-to-day life. Using these concept students can get idea of expanding universe.

CO4: Studying sound concept we can understand why the sound of male and female are different and the reason behind it.

CO5: Image formation related to geometrical optics, Deviation, Magnification, Concept for Equivalent lens and Cardinal Points.

CO6: Interference and diffraction of light, Formation of fringes, Resolution

CO7: Concept of Polarization, Double refraction, Construction and working of Nicol Prism.

Third Year

Semester V

Course-PHY-245411- DSC-Elements of Modern Physics

CO1: Studying Basic properties of nucleus, student got the idea of inner information of the nucleus.

CO2: From radioactivity chapter student knew that which radiations emit from radioactive material and how they are useful and harmful for the human.

CO3: From nuclear force student understood that apart from alpha, beta, gamma particle how many other particles are inside the nucleus.

CO4: Students will learn significance of Pauli's exclusion principle.

Semester VI

Course-PHY-245414-DSC - Quantum Mechanics

CO1: Introduction to Quantum Mechanics, Historical background, Matter Waves, Wave particle duality, Phase and Group Velocity, Heisenberg's Uncertainty Principle

CO2: Physical Interpretation of Wave function, Schrödinger's Wave Equation, Eigen Function and Eigen values

CO3: Free Particle, One Dimensional and Three Dimensional Rigid Box, Potential Barrier

CO4: Spherically symmetric potential, Examples of Rigid Rotor and hydrogen atom

CO5: Hermitian and other operators in Quantum Mechanics, Commutator brackets and concept of parity

SKILL ENHANCEMENT COURSE

Course-PHY-243313-SEC- Electronics I

CO 1: 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.

CO 2:- Knowledge about semiconductors since it is a basic materials used in many electronic components like diode, transistors FET, UJT etc.

CO 3: Characteristics and working of operational amplifiers which are useful in various medical and scientific investigations to amplify the signals.

CO 4:- Generation of high frequency signals using oscillator circuits and their applications in radio and TV communication

CO 5: Concepts of regulated power supply, rectifiers, filters and regulators.

CO 6: An introduction to digital electronics which is useful in digital computers. Also logic gates and their application.

Course-PHY-243314-SEC- Electronics II

Students can learn the design and working of electronics used in different applications.

CO1: Amplifiers, Class A, Class B and Class C , Push Pull emitter follower and differential amplifier

CO2: Junction Field Effect Transistor and MOS Field Effect Transistor, Working and applications

CO3: Operational Amplifiers its parameters, characteristics and applications

CO4: 555 timer, Astable, Monostable and Bistable Multivibrator

CO5: Regulated power supply using IC 723

CO6: Combinational Circuits like Adder, Subtractor and Multiplexer, Binary to Gray code conversion

CO7: Sequential Logic Circuits, Flip- Flop, Counters and Shift Register

