# Programme Specific Outcomes (PSOs) and Course Outcomes (COs)

Programme

**BSc Physics** 



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## **PROGRAMME OUTCOMES**

## PO 1. Critical Thinking:

1. Acquire the ability to apply the basic tenets of logic and science to thoughts, actions and interventions.

2. Develop the ability to chart out a progressive direction for actions and interventions by learning to recognize the presence of hegemonic ideology within certain dominant notions.

3. Develop self-critical abilities and also the ability to view positions, problems and social issues from plural perspectives.

## PO 2. Effective Citizenship:

1. Learn to participate in nation building by adhering to the principles of sovereignty of the nation, socialism, secularism, democracy and the values that guide a republic.

2. Develop and practice gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalisation.

3. Internalise certain highlights of the nation's and region's history. Especially of the freedom movement, the renaissance within native societies and the project of modernisation of the post- colonial society.

## PO 3. Effective Communication:

1. Acquire the ability to speak, write, read and listen clearly in person and through electronic media in both English and in one Modern Indian Language

2. Learn to articulate analysis, synthesis, and evaluation of situations and themes in a well- informed manner.

3. Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.

## PO 4. Interdisciplinarity:

1. Perceive knowledge as an organic comprehensive, interrelated and integrated faculty of the human mind

2. Understand the issues of environmental contexts and sustainable development as a basic interdisciplinary concern of all disciplines.

3. Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.

## **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

PSO 1.Understand the historical contexts behind the origin and development of English literature with a special focus on various movements and the important works belonging to such movements.

PSO 2. Understand the current methodological issues in the study of literature and apply various reading strategies employed to selected literary as well as cultural texts.

PSO 3. Understand and apply the extended meaning of "English Literature" to various post-colonial and other writings in English.

PSO 4. Understand the basics of disciplines like Film Studies, Culture Studies, Fine Arts, Women's Writing, Dalit Writings, Post-colonial writing, Indian writing in English, Malayalam Literature and Literatures in Translation.

PSO 5. Understand and appreciate the interdisciplinary links that literary studies have with disciplines like Philosophy, History, Political Science, Sociology, Anthropology and the Sciences.

## **COURSE OUTCOMES (PSOs)**

**1B01PHY** 

**MECHANICS** 

CO 1: Understand Newton's laws of motion, the concepts of linear and angular

momentum and torque

CO2: Determine the Centre mass of a given configuration

CO3: Understand the principle of work, energy and power

CO4: Determine angular momentum of a body about any given axis

## 2B02PHY

## MATHEMATICAL PHYSICS AND ERROR ANALYSIS

CO 1: Understand vector operations and vector algebra

CO2: Determine derivative and integral of various functions

CO3: State fundamental theorems of calculus

CO4: Compare differential operators in various coordinate systems CO5: Understand the basic concepts of modeling

CO6: Solve first order and second order ODEs

CO7: Estimate uncertainties in measured values

#### 3B03PHY

## **MECHANICS II**

CO1: Understand the concept of Galilean transformations and uniformly accelerating systems

CO2: Determine the trajectory of a body in central force problem using Newton's laws

CO3: Understand Kepler's laws of planetary motion CO4: Formulate the mathematical equation of waves

CO5: Understand the concept and consequences of special theory of relativity

#### 4B04PHY

## **ELECTRONICS I**

CO 1: Understand the basics of PN junction diode, Zener diode and their applications

CO2: Understand the structure, operations and characteristics of BJT and FET

CO3 :Understand the biasing methods and design of BJT and FET circuits

CO4: Understand the different number systems, conversions and binary arithmetic operations

CO5 : Understand the basic combinational logic gates

CO6 : Understand the Boolean algebra & logic simplification using Boolean algebra

## 5B06PHY

## QUANTUM MECHANICS

CO1: Familiarize with apparatus for mechanical, electrical, magnetic and optical experiments.

- CO2: Develop skill in setting up of apparatus for accurate measurement of physical quantities.
- CO3: Understand multiple experimental techniques for determining physical quantities.
- CO4: Develop skill in systematic way of measurements by minimizing possible errors.
- CO5: Develop skill to analyze by plotting graphs using software.
- CO6: Develop skill for systematic trouble shooting.
- CO7: Perform error analysis for experiments.

## 5B07PHY

## ELECTROSTATICS AND MAGNETOSTATICS

CO1: Understand the concept of Electric field, electric potential, magnetic field and magnetic potentials

- CO2: Use the principle of superposition and law of Gauss to calculate electric field Intensity
- CO3: Determine Electric potential of charge distributions and hence specify electric field intensity
- CO4: Understand the basic properties of conductors and capacitors
- CO5: Calculate the magnetic fields due to currents using Biot-Savart and Ampere laws.
- CO6: Compare Magnetostatics and Electrostatics.
- CO7: Understand Diamagnets, Paramagnets and Ferro magnets.

**5B08PHY** 

## THERMODYNAMICS AND STATISTICAL MECHANICS

CO1: Understand the concept of temperature ,the thermodynamic state and equilibrium.

CO2: Explain the first law of thermodynamics through work and heat and its Mathematical Formulation.

CO3: Understand the ideal gas equation and kinetic theory of gases Understand the second law of thermodynamics and thermodynamic temperature scale.

CO4: Define entropy and thermodynamic potentials Understand the basic concepts of Statistical mechanics

## 5B09PHY

**ELECTRONICS II** 

CO 1: Understand the AC analysis of BJT circuits and CE amplifiers

CO2:Understand the feedback circuits, oscillators and power amplifiers

CO3:Understand OPAMP basics and different OPAMP circuits

CO4:Understand the standard forms Boolean Expressions, Functions of Combinational Logic and K map simplifications.

#### 6B10PHY

## SOLID STATE PHYSICS AND SPECTROSCOPY

CO 1: Understand basic crystal structure and compare various crystal systems

CO2: State and prove Bragg's law Explain X-ray diffraction and various methods to obtain diffraction pattern Understand basic properties

of semiconductors and band structure of solids

CO3: Discuss Hall Effect and list its applications

CO4: Describe various regions of EM spectrum

CO5: Distinguish between microwave and infrared spectroscopy

CO6: Define Raman Effect and explain its quantum theory

#### 6B11PHY

**OPTICS AND PHOTONICS** 

CO 1: Understand the concept of interference and diffraction

CO2: Distinguish between Fresnel and Fraunhoffer diffraction

CO3: Analyse mathematically diffraction pattern due to slits and apertures

CO4: Understand the concept of polarization and double refraction

CO5: Understand the basic principle and working of lasers

CO6: Explain different types of lasers

CO7: Understand the principle of holography and its applications

CO8:Understand the principle of total internal reflection and propagation of light through optical fibres

CO9:Compare different types of optical fibres and their applicationsOptics and Photonics.

## NUCLEAR, PARTICLE & ASTROPHYSICS

CO1: Understand the structure nucleus and nuclear constituents

**6B12PHY** 

- CO2: Define nuclear forces and nuclear reactions
- CO3: Familiarize elementary particles and their properties Understand stellar classifications
- CO4: Understand basic concepts of birth of the star Identify different stars in HR diagram
- CO5: Understand the theory of death of the star Define white dwarf, neutron star and black hole

## 6B13PHY ELECTRODYNAMICS AND CIRCUIT THEORY

- CO 1 : Understand the basic concepts of Electrodynamics
- CO2 : Explain the mathematical theory of Electromagnetic waves
- CO3 : Understand different Network theorems
- CO4 : Understand the basic concepts of Transient currents

## 6B14PHY(1).PYTHON PROGRAMMING

- CO 1: Develop skills in creating program sketches of scientific problems
- CO2: Develop basic skills in logical thinking and programming
- CO3: To make real-life scientific problems easier on a computer with user interaction and graphics