Name of the programme	Bachelor of Science in Physics
Short Name of the programme	B.Sc. Physics
Code of the programme	PHY

PROGRAMME OUTCOMES - POs		
Sl. NO	CO No:	Programme Outcomes
1	PO 1	Acquire the ability to apply the basic principles of logic and science to thoughts, actions and interventions.
2	PO 2	Perceive knowledge as a comprehensive, interrelated and integrated faculty of the human mind.
3	PO 3	Generate hypothesis and articulate assent or dissent by employing both reason and creative thinking.
4	PO 4	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.
5	PO 5	Develop self-critical abilities and the ability to view positions, problems and social issues from plural perspectives.
6	PO 6	Participate in nation building by adhering to the principles of scientific temper, sovereignty, socialism, secularism, democracy and the values that guide a republic.
7	PO 7	Develop gender sensitive attitudes, environmental awareness, the ability to understand and resist various kinds of discriminations and empathetic social awareness about various kinds of marginalization.
8	PO 8	Understand the issues related to the current environmental problems and apply the principles of science for a sustainable development in an interdisciplinary manner.
9	PO 9	Develop communication skill in English and local languages through different media.
10	PO 10	Learn to articulate analysis, synthesis, and evaluation of situations and themes in a scientific manner.
11	PO 11	Develop aesthetic, social, humanistic and artistic sensibilities for problem solving and evolving a comprehensive perspective.
12	PO 12	Attain a high level of scientific excellence, and develop hand-pick and apply appropriate techniques, resources and modern technologies for sustainable development.

PROGRAMME SPECIFIC OUTCOMES - PSOs		
Sl. NO	CO No:	Programme Specific Outcomes
1	PSO 1	Understand the basic concepts of fundamentals of mechanics, properties of matter and electrodynamics

2	PSO 2	Understand the theoretical basis of quantum mechanics, relativistic physics, nuclear physics, optics, spectroscopy, solid state physics, astrophysics, statistical physics, photonics and thermodynamics
3	PSO 3	Understand and apply the concepts of electronics in the designing of different analog and digital circuits
4	PSO 4	Understand the basics of computer programming and numerical analysis
5	PSO 5	Apply and verify theoretical concepts through laboratory experiments

COURSE OUTCOMES - COs

Core Course

Semester	Course code	Course Title	CO No:	Course Outcomes
1	PHY1 B01:	MECHANICS – I	CO1	Understand and apply the basic concepts of Newtonian Mechanics to Physical Systems
			CO2	Understand and apply the basic idea of work-energy theorem to physical systems
			CO3	Understand and apply the rotational dynamics of rigid bodies
2	PHY2 B02:	MECHANICS – II	CO1	Understand the features of non-inertial systems and fictitious forces
			CO2	Understand and analyze the features of central forces with respect to planetary forces
			CO3	Understand the basic ideas of Harmonic Oscillations
			CO4	Understand the analyze the basic concepts of wave motion
3	PHY3B03:	ELECTRODYNAMICS I	CO1	Understand and apply the fundamentals of vector calculus
			CO2	Understand and analyze the electrostatic properties of physical systems
			CO3	Understand the mechanism of electric field in matter.
			CO4	Understand and analyze the magnetic properties of physical systems
			CO5	Understand the mechanism of magnetic field in matter.
4	PHY4B04:	ELECTRODYNAMICS II	CO1	Understand the basic concepts of electrodynamics
			CO2	Understand and analyze the properties of electromagnetic waves
			CO3	Understand the behavior of transient currents
			CO4	Understand the basic aspects of ac circuits
			CO5	Understand and apply electrical network theorems
	PHY4B05	PRACTICAL I	CO1	Apply and illustrate the concepts of properties of matter through experiments
			CO2	Apply and illustrate the concepts of electricity and magnetism through experiments
			CO3	Apply and illustrate the concepts of optics through experiments

			CO4	Apply and illustrate the principles of electronics through experiments
5	PHY5B06	COMPUTATIONAL PHYSICS	CO1	Understand the Basics of Python programming
			CO2	Understand the applications of Python modules
			CO3	Understand the basic techniques of numerical analysis
			CO4	Understand and apply computational techniques to physical problems
	PHY5B07	QUANTUM MECHANICS	CO1	Understand the particle properties of electromagnetic radiation
			CO2	Describe Rutherford – Bohr model of the atom
			CO3	Understand the wavelike properties of particles
			CO4	Understand and apply the Schrödinger equation to simple physical systems
			CO5	Apply the principles of wave mechanics to the Hydrogen atom
	PHY5B08	OPTICS	CO1	Understand the fundamentals of Fermat's principles and geometrical optics
			CO2	Understand and apply the basic ideas of interference of light
			CO3	Understand and apply the basic ideas of diffraction of light
			CO4	Understand the basics ideas of polarization of light
			CO5	Describe the basic principles of holography and fibre optics
	PHY5B09	ELECTRONICS (ANALOG & DIGITAL)	CO1	Understand the basic principles of rectifiers and dc power supplies
			CO2	Understand the principles of transistor
			CO3	Understand the working and designing of transistor amplifiers and oscillators
			CO4	Understand the basic operation of Op – Amp and its applications
			CO5	Understand the basics of digital electronics
	PHY6B10	THERMODYNAMICS	CO1	Understand the zero and first laws of thermodynamics
			CO2	Understand the thermodynamics description of the ideal gas
			CO3	Understand the second law of thermodynamics and its applications
			CO4	Understand the basic ideas of entropy
			CO5	Understand the concepts of thermodynamic potentials and phase transitions
	PHY6B11	STATISTICAL PHYSICS, SOLID STATE PHYSICS, SPECTROSCOPY &	CO1	Understand the basic principles of statistical physics and its applications
			CO2	Understand the basic aspects of crystallography in solid state physics
			CO3	Understand the basic elements of spectroscopy

	SPECTROSCOPY & PHOTONICS	CO4	Understand the basics ideas of microwave and infra-red spectroscopy
		CO5	Understand the fundamental ideas of photonics
PHY6B12	NUCLEAR PHYSICS AND PARTICLE PHYSICS	CO1	Understand the basic aspects of nuclear structure and fundamentals of radioactivity
		CO2	Describe the different types of nuclear reactions and their applications
		CO3	Understand the principle and working of particle detectors
		CO4	Describe the principle and working of particle accelerators
		CO5	Understand the basic principles of elementary particle physics
PHY6B13	RELATIVISTIC MECHANICS AND ASTROPHYSICS	CO1	Understand the fundamental ideas of special relativity
		CO2	Understand the basic concepts of general relativity and cosmology
		CO3	Understand the basic techniques used in astronomy
		CO4	Describe the evolution and death of stars PSO2 U C 12
		CO5	Describe the structure and classification of galaxies
PHY6B14 (EL1)	BIOMEDICAL PHYSICS	CO1	Understand the basic principles of biophysics
		CO2	Understand the fundamentals of medical instrumentation
		CO3	Understand the principles of ultrasound and x-ray imaging
		CO4	Understand the basic principles of NMR
		CO5	Describe the applications of lasers in medicine
PHY6B14 (EL2)	NANOSCIENCE AND TECHNOLOGY	CO1	Understand the elementary concepts of nanoscience
		CO2	Understand the electrical transport mechanisms in nanostructures
		CO3	Understand the applications of quantum mechanics in nanoscience
		CO4	Understand the fabrication and charecterisation techniques of nanomaterials
		CO5	Enumerate the different applications of nanotechnology
PHY6B14 (EL3)	MATERIALS SCIENCE	CO1	Understand the basic ideas of bonding in materials
		CO2	Describe crystalline and non crystalline materials
		CO3	Understand the types of imperfections nad diffusion mechanism in solids
		CO4	Describe the different properties of ceramics and polymers
PHY6B15	PRACTICAL II	CO1	Apply and illustrate the concepts of properties of matter through experiments
		CO2	Apply and illustrate the concepts of electricity and magnetism through experiments
		CO3	Apply and illustrate the concepts of optics and spectroscopy through experiments
		CO4	Apply and illustrate the principles of heat through experiments

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			CO1	Apply and illustrate the principles of semiconductor diode and transistor through Experiments
	PHY6B16	PRACTICAL III	CO2	Apply and illustrate the principles of transistor amplifier and oscillator through experiments
			CO3	Apply and illustrate the principles of digital electronics through experiments
			CO4	Analyze and apply computational techniques in Python programming
	PHY6B17(P)	PHY6B17(P)	CO1	Understand research methodology
			CO2	Understand and formulate a research project
			CO3	Design and implement a research project identifying and enumerate the scope and limitations of a reserch project
Open Course				
5	PHY5D01(2)	OPEN COURSE -AMATEUR ASTRONOMY AND ASTROPHYSICS	CO1	Describe the history and nature of astronomy as a science
			CO2	Understand the motion of earth in space and the cause of seasons
			CO3	Understand the basic elements of solar system
			CO4	Understand the elementary concepts of solar system