B.SC. PHYSICS

PROGRAMME SPECIFIC OUTCOME

PSO1   Understand the basic concepts of methodology of science and the fundamentals of mechanics, properties of matter and electrodynamics

PSO2   Understand the theoretical basis of quantum mechanics, relativistic physics, nuclear physics, optics, spectroscopy, solid state physics, astrophysics, statistical physics, photonics and thermodynamics

PSO3   Understand and apply the concepts of electronics in the designing of different analog and digital circuits

PSO4   Understand the basics of computer programming and numerical analysis

PSO5   Apply and verify theoretical concepts through laboratory experiments

COURSE OUTCOME

SJPHY1B01: MECHANICS I

SJPHY1B01CO1	Understand and apply the basic concepts of Newtonian Mechanics to physical systems
SJPHY1B01CO2	Understand and apply the basic idea of work-energy theorem to physical systems
SJPHY1B01CO3	Understand and apply the rotational dynamics of rigid bodies

SJPHY2B02: MECHANICS II

SJPHY2B02CO1	Understand the features of non-inertial systems and fictitious forces
SJPHY2B02CO2	Understand, analyze the features of central forces in planetary motion
SJPHY2B02CO3	Understand the basics ideas of harmonic oscillations
SJPHY2B02CO4	Understand and analyze the basics concepts of wave motion

SJPHY3B03: ELECTRODYNAMICS I

SJPHY3B03CO1	Understand and apply the fundamentals of vector calculus
SJPHY3B03CO2	Understand and analyze the electrostatic properties of physical systems
SJPHY3B03CO3	Understand the mechanism of electric field in matter
SJPHY3B03CO4	Understand and analyze the magnetic properties of physical systems
SJPHY3B03CO5	Understand the mechanism of magnetic field in matter

SJPHY4B04: ELECTRODYNAMICS II

SJPHY4B04CO1	Understand the basic concepts of electrodynamics
SJPHY4B04CO2	Understand and analyze the properties of electromagnetic waves
SJPHY4B04CO3	Understand the behavior of transient currents
SJPHY4B04CO4	Understand the basic aspects of ac circuits
SJPHY4B04CO5	Understand and apply electrical network theorems

SJPHY5B06: COMPUTATIONAL PHYSICS

SJPHY5B06CO1	Understand the Basics of Python programming
SJPHY5B06CO2	Understand the applications of Python modules
SJPHY5B06CO3	Understand the basic techniques of numerical analysis
SJPHY5B06CO4	Understand and apply computational techniques to physical problems

SJPHY5B07: QUANTUM MECHANICS

SJPHY5B07CO1	Understand the particle properties of electromagnetic radiation
SJPHY5B07CO2	Describe Rutherford – Bohr model of the atom
SJPHY5B07CO3	Understand the wavelike properties of particles
SJPHY5B07CO4	Understand, apply the Schrödinger equation to simple physical systems
SJPHY5B07CO5	Apply the principles of wave mechanics to the Hydrogen atom

SJPHY5B08: OPTICS

SJPHY5B08CO1	Understand fundamentals of Fermat's principles and geometrical optics
SJPHY5B08CO2	Understand and apply the basic ideas of interference of light
SJPHY5B08CO3	Understand and apply the basic ideas of diffraction of light
SJPHY5B08CO4	Understand the basics ideas of polarization of light
SJPHY5B08CO5	Describe the basic principles of holography and fibre optics

SJPHY5B09: ELECTRONICS (ANALOG & DIGITAL)

SJPHY5B09CO1	Understand the basic principles of rectifiers and dc power supplies
SJPHY5B09CO2	Understand the principles of transistor
SJPHY5B09CO3	Understand the working and designing of transistor amplifiers and oscillators
SJPHY5B09CO4	Understand the basic operation of Op – Amp and its applications
SJPHY5B09CO5	Understand the basics of digital electronics

SJPHY6B10: THERMODYNAMICS

SJPHY6B10CO1	Understand the zero and first laws of thermodynamics
SJPHY6B10CO2	Understand the thermodynamics description of the ideal gas
SJPHY6B10CO3	Understand the second law of thermodynamics and its applications
SJPHY6B10CO4	Understand the basic ideas of entropy
SJPHY6B10CO5	Understand thermodynamic potentials and phase transitions

SJPHY6B11: STATISTICAL PHYSICS, SOLID STATE PHYSICS, SPECTROSCOPY & PHOTONICS

SJPHY6B11CO1	Understand the basic principles of statistical physics and its applications
SJPHY6B11CO2	Understand the basic aspects of crystallography in solid state physics
SJPHY6B11CO3	Understand the basic elements of spectroscopy
SJPHY6B11CO4	Understand the basics ideas of microwave and infra red spectroscopy
SJPHY6B11CO5	Understand the fundamental ideas of photonics

SJPHY6B12: NUCLEAR PHYSICS AND PARTICLE PHYSICS

SJPHY6B12CO1	Understand basic aspects of nuclear structure and fundamentals of radioactivity
SJPHY6B12CO2	Describe the different types of nuclear reactions and their applications
SJPHY6B12CO3	Understand the principle and working of particle detectors
SJPHY6B12CO4	Describe the principle and working of particle accelerators
SJPHY6B12CO5	Understand the basic principles of elementary particle physics

SJPHY6B13: RELATIVISTIC MECHANICS AND ASTROPHYSICS

SJPHY6B13CO1	Understand the fundamental ideas of special relativity
SJPHY6B13CO2	Understand the basic concepts of general relativity and cosmology
SJPHY6B13CO3	Understand the basic techniques used in astronomy
SJPHY6B13CO4	Describe the evolution and death of stars
SJPHY6B13CO5	Describe the structure and classification of galaxies

SJPHY6B14 (EL1): BIOMEDICAL PHYSICS

SJPHY6B14 (EL1)CO1	Understand the basic principles of biophysics
SJPHY6B14 (EL1)CO2	Understand the fundamentals of medical instrumentation
SJPHY6B14 (EL1)CO3	Understand the principles of ultrasound and x-ray imaging
SJPHY6B14 (EL1)CO4	Understand the basic principles of NMR
SJPHY6B14 (EL1)CO5	Describe the applications of lasers in medicine

SJPHY6B14 (EL2): NANOSCIENCE AND TECHNOLOGY

SJPHY6B14 (EL2)CO1	Understand the elementary concepts of nanoscience
SJPHY6B14 (EL2)CO2	Understand the electrical transport mechanisms in nanostructures
SJPHY6B14 (EL2)CO3	Understand the applications of quantum mechanics in nanoscience
SJPHY6B14 (EL2)CO4	Understand fabrication, characterization techniques of nanomaterials
SJPHY6B14 (EL2)CO5	Enumerate the different applications of nanotechnology

S SJPHY6B14 (EL3): MATERIALS SCIENCE

SJPHY6B14 (EL3)CO1	Understand the basic ideas of bonding in materials
SJPHY6B14 (EL3)CO2	Describe crystalline and non crystalline materials
SJPHY6B14 (EL3)CO3	Understand types of imperfections and diffusion mechanisms in solids
SJPHY6B14 (EL3)CO4	Describe the different properties of ceramics and polymers
SJPHY6B14 (EL3)CO5	Describe the different types of material analysis techniques

SJPHY4B05: PRACTICAL I

SJPHY4B05CO1	Apply, illustrate concepts of properties of matter through experiments
SJPHY4B05CO2	Apply, illustrate concepts of electricity and magnetism via experiments
SJPHY4B05CO3	Apply and illustrate the concepts of optics through experiments
SJPHY4B05CO4	Apply and illustrate the principles of electronics through experiments

SJPHY6B15: PRACTICAL II

SJPHY6B15CO1	Apply, illustrate concepts of properties of matter through experiments
SJPHY6B15CO2	Apply, illustrate concepts of electricity and magnetism via experiments
SJPHY6B15CO3	Apply, illustrate concepts of optics and spectroscopy via experiments
SJPHY6B15CO4	Apply and illustrate the principles of heat through experiments

SJPHY6B16: PRACTICAL III

SJPHY6B16CO1	Apply, illustrate principles of diode and transistor by experiments
SJPHY6B16CO2	Apply, illustrate principles of transistor amplifier, oscillator through experiments
SJPHY6B16CO3	Apply, illustrate principles of digital electronics through experiments
SJPHY6B16CO4	Analyze and apply computational techniques in Python programming

SJPHY6B17(P) – PROJECT

SJPHY6B17(P)CO1	Understand research methodology
SJPHY6B17(P)CO2	Understand and formulate a research project
SJPHY6B17(P)CO3	Design and implement a research project
SJPHY6B17(P)CO4	Identify and enumerate the scope and limitations of a research project

SJPHY6B17(R): RESEARCH METHODOLOGY (In lieu of Project)

SJPHY6B17(R)CO1	Understand research methodology
SJPHY6B17(R)CO2	Understand the concept of measurement in research
SJPHY6B17(R)CO3	Understand significance and limitations of experimentation in research
SJPHY6B17(R)CO4	Understand and formulate a research project, ethics and responsibility of scientific research