Name of the Course: PHYSICS

Programme Outcomes

PO1: Acquire adequate knowledge of the subject

PO2: Craft a foundation for higher learning

PO3: Be initiated into the basics of research

PO4: Imbibe sound moral and ethical values

PO5: Become conscious of environmental and societal responsibilities

PO6: Attain skills for communication and career

PO7: Learn to tolerate diverse ideas and different points of view

PO8: Become empowered to face the challenges of the changing universe

Programme Specific Outcomes

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 **Abbreviations used:**

CL – Cognitive level; **U –** understand; **Ap –** apply; **An –** analyze; **C** - create

KC – Knowledge category; **C –** conceptual; **F –** factual; **P** - procedural

Course Outcomes

CORE COURSES: B.SC 1ST 2ND& 3RD

1A: METHODOLOGY OF SCIENCE AND BASIC MECHANICS(B.SC1)

	Course Outcome	PSO	CL	KC
CO1	Understand the features, methods and limitations of science	PSO1	U	C
CO2	Understand and apply the basic concepts of Newtonian Mechanics to physical systems	PSO1	Ap	C, P
CO3	Understand and apply the basic idea of work- energy theorem to physical systems	PSO1	Ap	C,P
CO4	Understand and apply the rotational dynamics of rigid bodies	PSO1	Ap	C,P
CO5	Understand the basic ideas of elasticity	PSO1	U	C

1B: MECHANICS

	Course Outcome	PSO	CL	KC
CO1	Understand the features of non-inertial systems and fictitious forces	PSO1	U	C
CO2	Understand and analyze the features of central forces with respect to planetary motion	PSO1	An	C, P
CO3	Understand the basics ideas of harmonic oscillations	PSO1	U	C
CO4	Understand and analyze the basics concepts of wave motion	PSO1	An	C,P

2AELECTRODYNAMICS 1

	Course Outcome	PSO	CL	KC
CO1	Understand and apply the fundamentals of vector calculus	PSO1	Ap	C
CO2	Understand and analyze the electrostatic properties of physical systems	PSO1	An	C, P
CO3	Understand the mechanism of electric field in matter	PSO1	U	C,P
CO4	Understand and analyze the magnetic properties of physical systems	PSO1	An	C,P
CO5	Understand the mechanism of magnetic field in matter	PSO1	U	C,P

2B: ELECTRODYNAMICS II

	Course Outcome	PSO	CL	KC
CO1	Understand the basic concepts of electrodynamics	PSO1	U	C
CO2	Understand and analyze the properties of electromagnetic waves	PSO1	An	C, P
CO3	Understand the behavior of transient currents	PSO1	U	C
CO4	Understand the basic aspects of ac circuits	PSO1	An	C,P
CO5	Understand and apply electrical network theorems	PSO1	Ap	C,P

3: THERMODYNAMICS

	Course Outcome	PSO	CL	KC
CO1	Understand the zero and first laws of thermodynamics	PSO2	U	C
CO2	Understand the thermodynamics description of the ideal gas	PSO2	U	C
CO3	Understand the second law of thermodynamics and its applications	PSO2	U	C, P
CO4	Understand the basic ideas of entropy	PSO2	U	C
CO5	Understand the concepts of thermodynamic potentials and phase transitions	PSO2	U	C

1: QUANTUM MECHANICS (B.SC II)

	Course Outcome	PSO	CL	KC
CO1	Understand the particle properties of electromagnetic radiation	PSO2	U	C
CO2	Describe Rutherford – Bohr model of the atom	PSO2	U	C
CO3	Understand the wavelike properties of particles	PSO2	U	C
CO4	Understand and apply the Schrödinger equation to simple physical systems	PSO2	Ap	C,P
CO5	Apply the principles of wave mechanics to the Hydrogen atom	PSO2	Ap	C,P

2: OPTICS (B.SC II)

	Course Outcome	PSO	CL	KC
CO1	UnderstandthefundamentalsofFermat "s principles and geometricaloptics	PSO2	U	C
CO2	Understand and apply the basic ideas of interference of light	PSO2	Ap	C, P
CO3	Understand and apply the basic ideas of diffraction of light	PSO2	Ap	C, P
CO4	Understand the basics ideas of polarization of light	PSO2	U	C
CO5	Describe the basic principles of holography and fibre optics	PSO2	U	C

3: ELECTRONICS (ANALOG & DIGITAL) (B.SCII)

	Course Outcome	PSO	CL	KC
CO1	Understand the basic principles of rectifiers and dc power supplies	PSO3	U	C
CO2	Understand the principles of transistor	PSO3	U	C
CO3	Understand the working and designing of transistor amplifiers and oscillators	PSO3	Ap	C, P
CO4	Understand the basic operation of Op – Amp and its applications	PSO3	U	C
CO5	Understand the basics of digital electronics	PSO3	U	C

1: STATISTICAL PHYSICS, SOLID STATE PHYSICS (B.SCIII)

	Course Outcome	PSO	CL	KC
CO1	Understand the basic principles of statistical physics and its applications	PSO2	U	C
CO2	Understand the basic aspects of crystallography in solid state physics	PSO2	U	C
CO3	Understand the basic elements of spectroscopy	PSO2	U	C
CO4	Understand the basics ideas of microwave and infra red spectroscopy	PSO2	U	C
CO5	Understand the fundamental ideas of photonics	PSO2	U	C

2: NUCLEAR PHYSICS AND PARTICLE PHYSICS

	Course Outcome	PSO	CL	KC
CO1	Understand the basic aspects of nuclear structure and fundamentals of radioactivity	PSO2	U	C
CO2	Describe the different types of nuclear reactions and their applications	PSO2	U	C, P
CO3	Understand the principle and working of particle detectors	PSO2	U	C, P
CO4	Describe the principle and working of particle accelerators	PSO2	U	C, P
CO5	Understand the basic principles of elementary particle physics	PSO2	U	C

3: RELATIVISTIC MECHANICS AND ASTROPHYSICS

	Course Outcome	PSO	CL	KC
CO1	Understand the fundamental ideas of special relativity	PSO2	U	C
CO2	Understand the basic concepts of general relativity and cosmology	PSO2	U	C
CO3	Understand the basic techniques used in astronomy	PSO2	U	C
CO4	Describe the evolution and death of stars	PSO2	U	C
CO5	Describe the structure and classification of galaxies	PSO2	U	C

: PRACTICAL I

	Course Outcome	PSO	CL	KC
CO1	Apply and illustrate the concepts of properties of matter through experiments	PSO5	Ap	P
CO2	Apply and illustrate the concepts of electricity and magnetism through experiments	PSO5	Ap	P
CO3	Apply and illustrate the concepts of optics through experiments	PSO5	Ap	P
CO4	Apply and illustrate the principles of electronics through experiments	PSO5	Ap	P

: PRACTICAL II

	Course Outcome	PSO	CL	KC
CO1	Apply and illustrate the concepts of properties of matter through experiments	PSO5	Ap	P
CO2	Apply and illustrate the concepts of electricity and magnetism through experiments	PSO5	Ap	P
CO3	Apply and illustrate the concepts of optics and spectroscopy through experiments	PSO5	Ap	P
CO4	Apply and illustrate the principles of heat through experiments	PSO5	Ap	P

: PRACTICAL III

	Course Outcome	PSO	CL	KC
CO1	Apply and illustrate the principles of semiconductor diode and transistor through experiments	PSO5	Ap	P

: PRACTICAL I

CO2	Apply and illustrate the principles of transistor amplifier and oscillator through experiments	PSO5	Ap	P
CO3	Apply and illustrate the principles of digital electronics through experiments	PSO5	Ap	P
CO4	Analyze and apply computational techniques in Python programming	PSO5	Ap	P

SJPHY4C05: PHYSICS PRACTICAL I