POST GRADUATE DEPARTMENT OF PHYSICS
2022-23

M.Sc. Physics

Programme outcome (PO)1-

The Master of Science in Physics program provides the candidate with knowledge, general competence, and analytical skills on an advanced level, needed in industry, consultancy, education, and research.

On completion of program, the post graduates will

- Apply the knowledge and skill in the design and development of Electronics circuits to fulfill the needs of Electronic Industry.
- Become professionally trained in the area of electronics, optical communication, nonlinear circuits, materials characterization and lasers.
- Pursue research related to Physics and Materials characterization.
- Demonstrate highest standards of Actuarial ethical conduct and Professional Actuarial behavior, critical, interpersonal and communication skills as well as a commitment to life-long learning.

Programme specific outcome (PSO)1 :M.Sc.Physics -I

- Understanding the basic concepts of physics particularly concepts in classical mechanics, quantum mechanics, electrodynamics and electronics to appreciate how diverse phenomena observed in nature follow from a small set of fundamental laws.
- Learn to carry out experiments in basic as well as certain advanced areas of physics such as nuclear physics, electronics and lasers.
- A research oriented learning that develops analytical and integrative problem-solving approaches.

Course specific outcome (CO):

S.No.	Subject Name	Outcome
CO1.	Mathematical methods	• Knowledge about Vector calculus, Bessel Functions, Legendre Differential equations, complex variable, Laplace transforms, Fourier Series etc and their physical significance is learnt by students. These mathematicalconcepts are widely used in various physics derivations.

CO2.	Classical mechanics-I	This paper enables the students tounderstand : • The Lagrangian and Hamiltonian approaches inclassical mechanics. • The classical background of Quantum mechanics and get familiarized with Poisson brackets and Hamilton -Jacobiequation.
CO3.	Electrodynamics-I	After successful completion of thecourse, the student is expected to : • have gained a clear understanding of Maxwell's equations. • have grasped the idea of electrostatics and Magnetostatics along with time varying fields
CO4.	Quantum Mechanics-I	After successful completion of this paper, the student will be well-versedin • Linear vector spaces, Hilbertspace, concepts of basis and operators and bra and ket notation. • Both Schrödinger and Heisenberg formulations andtheir applications. • Theory of angular momentum and spin matrices, orbital angular momentum and Clebsh Gordan Coefficients. • Space-time symmetries and conservation laws, theory of identical particles, Oscillators

CO5.	Electronics-I	On completion of this course thestudent will learn about : • Field effect transistors, Bipolar junction transistors, amplifiers, Oscillators and their applications. Digital electronics basics usinglogic gates and working of major digital devices like flip flops, multivibrators etc.
CO6.	Microwave and its propagation	Students will come to know about: • Microwave linear beam tubes, microwave crossed beam tubes • Microwave transistor and tunnel diodes, Microwave FET,Charged coupled devices • Transmission lines and microwave measurements
CO7.	Remote Sensing	Students will come to know about: • History and Scope of Sensors • Types of Satellites • Microwaves and its applications
CO8.	Laboratory Practice: (i) Electronics Lab (ii) Optics Lab (iii) Laboratory Seminar+Viva Voce	Students will have hand on experienceof : • Amplifiers, diodes, variouslogic gates, flip-flops and multivibrator. • Solar cell, Michelson interferometer, photovoltaiccell, lasers and various optoelectronic devices • Seminars of students will be conducted on recent topics related to Physics

CO9.	Mathematical methods	Students will come to know about: • Hermite & Laguerre Polynomials,Tensors, Partial Differential equations and Group Theory. • The Physical Significance of each method is taught to have knowledge about their applications
CO10	Classical mechanics-II	This paper enables the students to understand : • Two body central force problem • Special theory of relativity • Kinematics and Dynamics of rigid body in detail and ideas regarding Euler's equations ofmotion. • Theory of small oscillations indetail along with basis of Free vibrations. • Theory of rigid body kinematics and dynamics.
CO11.	Electrodynamics-II	After successful completion of the course, the student is expected to : • have gained a clear understanding of Maxwell's equations. • know that laws of reflection, refraction are outcomes of electromagnetic boundary conditions. They will also be able design dielectric coatingswhich act like antireflection coatings. • Boundary value problems in electrostatics

CO12.	Quantum Mechanics-II	After successful completion of this paper, the student will be well-versedin • Time Dependent and independent Perturbation Theory, Variational Method, WKB Method, Collision Theoryand Relativistic Quantum Mechanics.
CO13.	Electronics-II	On completion of this course the student will learn about : • Operational amplifiers, comparator and applications, Voltage regulators and featuresof Timer 555. • Transistor Biasing Circuits • Modulation and communications • Comparator and applications
CO14.	Physics of Electronic Devices and Fabrication of Integrated Circuits and Systems	On completion of this course the student will learn about : • Microwave devices, photonic devices and all the electronic devices. • Fabrication of integrated devices
CO15.	Science and Technology of Solar Hydrogen and other renewable energies	On the completion of this course the students will learn in detail about: • Solar energy and solar cell fabrication • Hydrogen energy and its production, storage • Safety and utilization of Hydrogen as a fuel. • Basics about other renewable clean energies

CO16.	Laboratory Practice: (iv) Electronics Lab (v) Optics Lab (vi) Laboratory Seminar+ Viva Voce	Students will have hand on experienceof: • Amplifiers, diodes, variouslogic gates, flip-flops and multivibrator. • Solar cell, Michelson interferometer, photovoltaiccell, lasers and various optoelectronic devices • Seminars of students will be conducted on recent topics related to Physics
CO17.	Open Elective Subject (Domestic Use of Electric Gadgets)	On the completion of this course, the students (Not from the subject of Physics) will come to know about • The Basic safety precautions while using electric gadgets • Basics of electronic instruments • Basics of daily use household gadgets.

Programme specific outcome (PSO) 2 - (M.Sc. Physics II)

The M.Sc.-II (Physics) Program includes various core courses such as condensed matter physics, statistical mechanics, nuclear and particle physics, spectroscopy and microprocessors. The choice of advanced elective courses offers a glimpse in the frontier areas of research and allows students to work on research projects. The program also provide adequate exposure to the students for pursuing higher education in the field of technology (M. Tech.), Physics (M.Phil./Ph.D.) and other job opportunities in academia and industry. The diverse lab experiments allow students to understand the fundamental aspects of the subject.

Course specific outcome (CO):

S.No.	Subject Name	Outcome
CO1.	Condensed matter Physics -I	Students will know about: • Introducing basic conceptsvia diffraction methods, lattice vibrations and free electrons, Hall effect. • Understanding the basic transport properties of metals and semiconductors. • Their introduction to the band structures for studying different materials

CO2.	Nuclear Physics	On completion of this course the student will learn about : • have a basic knowledge of nuclear size ,shape , binding energy.etc and alsothe characteristics of nuclear force in detail. • be able to gain knowledge about various nuclear models and potentials associated. • Grasp knowledge about Nuclear reactions, Fissionand Fusion and their characteristics.
CO3.	Statistical Mechanics	The students should be able to : • Explain statistical physics and thermodynamics as logical consequences of thepostulates of statistical mechanics. • Apply the principles of statistical mechanics to selected problems. • Grasp the basis of ensemble approach in statistical mechanics to a range of situations. • To learn the fundamental differences between classical and quantum statistics and learn aboutquantum statistical distribution laws. Study important examples of ideal Bose systems and Fermi systems
CO4.	Computational Physics-I Computational Physics-I Practical	The students will have detailed theoretical and practical understanding of C++
CO5.	Laser Physics	The students will learn about • Introductory concepts of lasers and interaction of radiation with matter, • Various types of lasers and laser spectroscopy.

CO6.	Material Science	The student will get familiar with • Crystal imperfections • Diffusion in solids and mechanical properties • Phase transformations and heat treatment
CO7.	Laboratory Practice: 1. Nuclear Physics & Counter Electronics Laboratory 2. Condensed Matter Physics and Advanced Electronics Laboratory 3. Seminar	Students will have hand on experience of : • GM-counter, Scintillation detector. • Hall coefficient, Curie temperature, B-H curve. • Digital electronics experiments. • Seminars related to recent Physics concepts
CO8.	Condensed matter Physics -II	• Students will know about: • Introducing the behavior of ferroelectric and ferromagnetic material in terms of their properties and applications. • Superconductivity and lattice defects
CO9.	Nuclear and Particle Physics	On completion of this course the student will learn about : • acquire knowledge about nuclear decay processes and their outcomes. Have a wide understanding regarding alpha, beta and gamma decay. • understand the basic forces in nature and classification of particles and study in detail conservations laws and quark models in detail

CO10.	Atomic and Molecular Physics	After successful completion of the course, the student is expected to : • know about different atom model and will be able to differentiate different atomic systems, different coupling schemes and their interactions with magnetic and electric fields. • Have gained ability to apply the techniques of microwave and infrared spectroscopy to elucidate the structure of molecules. • Be able to apply the principle of Raman spectroscopy and its applications in the different field of science & Technology. • To become familiar with different resonance spectroscopic techniques and its applications. • to find solutions to problems related different spectroscopic systems.
CO11.	Computational Physics-II Computational Physics-II Practical	The student will learn about • classes and optics, objects, constructors, pointers • iterative methods and numerical differentiation and integration • Programs related to concepts learned in theory

CO12.	Experimental techniques in Nuclear Physics	After successful completion of the course, the student is expected to : • Have gained a clear understanding of data interpretation and analysis. • Interaction of radiation and its detection • Different types of detectors and scintillators
CO13.	Experimental techniques in Physics	After successful completion of the course, the student is expected to : • Have gained a clear understanding of different vacuum pumps and the production and maintenance of vacuum systems and its uses and needs in Physics . • Understands in depth about thin film preparation and production controlling techniques and the application of thin films in the field of science & Technology. • Have grasped the idea of Cryogenics technology and its applications . • understand about different material analysis techniques and applications.

CO14.	Laboratory Practice: 1. Nuclear Physics & Counter Electronics Laboratory 2. Condensed Matter Physics and Advanced Electronics Laboratory 3. Seminar	Students will have hand on experience of : • GM-counter, Scintillation detector. • Hall coefficient, Curie temperature, B-H curve. • Digital electronics experiments. • Seminars related to recent Physics concepts
CO15.	Project Work	This work would be offered to top five students of M.Sc. –I Physics and students will get a flavor of research after doing the project. The students doing project work will get the exemption from laboratory work and one theory paper of Computational Physics -II

Programme outcome

B.Sc. Physics

At the graduation in science a student should have:

- Acquired the knowledge with facts and figures related to various subjects in pure sciences such as Physics, Chemistry and Mathematics, etc.
- Understood the basic concepts, fundamental principles, and the scientific theories related to various scientific phenomena and their relevancies in the day-to-day life.
- Acquired the skills in handling scientific instruments, planning and performing in laboratory experiments.
- The skills of observations and drawing logical inferences from the scientific experiments.
- Analyzed the given scientific data critically and systematically and the ability to draw the objective conclusions.
- Been able to think creatively (divergently and convergent) to propose novel ideas in explaining facts and figures or providing new solution to the problems.
- Realized how developments in any science subject helps in the development of other science subjects and vice-versa and how interdisciplinary approach helps in providing better solutions and new ideas for the sustainable developments.
- Developed scientific outlook not only with respect to science subjects but also in all aspects related to life.
- Realized that knowledge of subjects in other faculties such as humanities, performing arts, social sciences etc. can have greatly and effectively influence which inspires in evolving new scientific theories and inventions.

Programme specific outcome (B.Sc.-I)

On completion of the Programme student will be able to:

- Articulate in-depth understanding of core knowledge on various subjects of Physics, especially in the area of mechanics and electricity and magnetism.
- Demonstrate skills and competencies to conduct scientific experiments.
- Identify their area of interest.
- Relate their knowledge and skills in carrying out independent work in the laboratories.
- Discuss, debate and communicate in a clear and logical ways to understand the basic concepts of Physics.

Course specific outcome:

S.No.	Subject Name	Outcome
1.	Mechanics	On successful completion of the course students would have : • grasped the knowledge of the fundamentals of different types of frames of references and transformation laws. (Both Galilean and Lorentz). • learned conservation laws of energy and linear and angular momentum and apply them to solve problems. • learned the basics of potentials and fields, central forces and Kepler's laws • learned fundamental ideas of special theory of relativity such as length contraction and time dilation and mass – energy invariance.
2.	Electricity and magnetism	After successful completion of the course, the student is expected to: • have gained elaborated knowledge about the electrostatics and laws governing the charge distribution. • have gained ability to apply Laplace equation for calculating potentials. • study in depth about Polarization, bound charges and boundary conditions. • realize the importance of application of Biot Savarts Law and Amperes law. • understand the relevance of different magnetization and the boundary condition of magnetic field.
3.	Physics Lab (Mechanics and Electricity Magnetism Lab)	Students will have hand on experience of: • Pendulums, sextant, Vanier calliper, screw gauge, traveling microscope, Maxwell needle, flywheel. • D-sauté bridge, multimeter, ballistic galvanometer, LCR circuits, carry foster bridge and solenoid.

Programme specific outcome (B.Sc.-II)

The B.Sc.-IIprogramme includes two core courses ofPhysics such as Thermal physics (including statistical mechanics), wave and optics. The programmeaims to develop the following abilities:

- Read, understand and interpret physical information – verbal, mathematical and graphical.
- The foundation for the higher education such as M.Sc. in sciences is developed, as thermal and statistical physics alongwith wave and optics are the foremost important subjects of pure sciences.
- Perform experiments and interpret the results of observation, which includes making an assessment of experimental uncertainties.

Course specific outcome:

S.No.	Subject Name	Outcome
1.	Thermal Physics and Statistical mechanics	After successful completion of the course, the student is expected to: • become familiar with various thermodynamic process and work done in each of these processes. • have a clear understanding about reversible and irreversible process and also working of a Carnot engine, and knowledge of calculating change in entropy for various process. • realize the importance of Thermo dynamical functions and applications of Maxwell's relations. • familiarize in depth about statistical distribution and have basic ideas of MaxwellBoltzmann,Bose-Einstein and Fermi Dirac Statistics and their applications.

2.	Waves and Optics	On successful completion of the course students will be able to: • understand the basics of the methods to solve problems of geometrical optics. • use the principles of wave motion and superposition to explain the physics of polarization, interference and diffraction. • understand the basics of Lasers. • Solve problems in optics by selecting the appropriate equations and performing numerical or analytical calculations.
3.	Physics Lab (Thermal Physics and Wave Optics Lab)	Students will have hand on experience of : • Searle's method, thermocouple, C-B constants, Stefan's constant, Lee disc Coupled oscillators, Lissajous figures, Cauchy constants, experiments with prisms, Michelson Interferometer and Newton rings.
4.	Environmental and road safety awareness	The field of environmental science can be divided into three main goals, which are to learn • how the natural world works, • to understand how we as humans interact with the environment, • and also, to determine how we affect the environment. • Road safety education is the program of educational activities around road safetythat is provided to children and young people .

Programme specific outcome (B.Sc.-III)

At the completion of B. Sc. in Physics students are able to:

- demonstrate a rigorous understanding of the core theories & principles of physics, which includes solid state physics, digital and analog circuits, & quantum mechanics. along with nuclear physics.
- Learn the concepts as Quantum Mechanics introduced at degree level in order to understand nature at atomic levels. Provide knowledge about material properties and its application for developing technology to ease the problems related to the society.

- Understand the relationship between particles & atom, as well as their creation & decay. Relate the structure of atoms & subatomic particles.
- Understand the fundamental theory of nature at small scale & levels of atom & sub-atomic particles.
- Learn to carry out experiments in basic as well as certain advanced areas of physics.

Course specific outcome:

S.No.	Subject Name	Outcome
1.	Solid State Physics and Quantum mechanics	After successful completion of the course, the student is expected to : • have a clear picture of crystal structures and a clear understanding about x-ray diffraction • expected to gain knowledge of superconductivity, its underlying principles and its applications in modern world. • become familiar with Blackbody radiation, Ultraviolet catastrophe, Photoelectric effect and Compton Effect. • Have gained a clear knowledge about wave properties of particles,De Broglie waves and its implications on theuncertainty principle. • study the Bohr Atom model in detail and understand about atomic excitations. • have grasped the idea of wave mechanics and gain the concept of eigen values, eigen functions and learn the basic postulates of quantum mechanics. • find solution to Schrödinger's equation for many systems such as particle in a box, Hydrogen Atom and familiarize with different quantum numbers.

2.	Digital and analog circuits and instrumentations, and Nuclear and Particle physics.	After successful completion of the course, the student is expected to • have a basic knowledge of semiconductor physics. • acquire knowledge about semiconductor diodes and rectifiers. • learn how to construct a transistor amplifier and how its gain varies with frequency. • know about various number systems and their applications, flip flops and counters. • gain a clear picture of nuclear composition and various nuclear models. • have a deep knowledge about radio activity, nuclearfission and nuclear fusion, the relevance of nuclear transformations. • understand the working of nuclear detectors and counters, realize the importance of Cosmic rays and its effects on earth • become familiar with nuclear particles and different particle accelerators.
3.	Physics Lab (Solid state and Quantum mechanics Lab)	Students will have hand on experience of: • Solenoid working, B-H curve, hall coefficient, and curie temperature. • Frank hertz, Zeeman effect (Quantum mechanics).
4.	Physics Lab (Digital and analog circuits and instrumentations, and nuclear physics lab)	Students will learn the working of: • Logic gates, FET, BJT pn junction diode, and transistors. • GM Scintillation counters (Nuclear physics).

B.Sc. Physics (Honors)

Programme outcome (PO)

Upon completion of the B.Sc. (Honours) Physics programme, students will be able to:

PO1: Comprehend the adequate knowledge about the concepts, principles and tools required for effective scientific, social and economic skills which the students can apply in individual and professional life.

PO2: Gain a thorough and logical understanding in fundamentals of Science and Humanities for the holistic development of students.

PO3: Demonstrate high standards of actuarial ethical conduct, professional behavior, interpersonal and communication skills as well as a commitment to lifelong learning through pure and applied sciences.

PO4: Be initiated into the basics of scientific and applied research which will be helpful for the students to generate employability.

PO5: Be equipped with practical exposure in the field of science and humanities.

Programme specific outcome (PSO)

(B.Sc.-I Physics Honors)

On completion of the Programme student will be able to:
PSO1: Articulate in-depth understanding of core knowledge on various subjects of Physics (especially in the area of mechanics, electricity and magnetism, waves and optics and mathematical methods of Physics) and other sciences.
PSO2: Demonstrate skills and competencies to conduct experiments based on mechanics, electricity, magnetism, waves, optics and entrepreneurship.
PSO3: Relate their knowledge and skills to carry out research oriented learning and to develop analytical problem solving approaches.

Course specific outcome: (CO)

S.No.	Subject Name	Outcome
1.	Mathematical Physics-I	On successful completion of the course students would have grasped the knowledge of CO1: Learn and understand calculus. Starting with review of differentiation, exponential and logarithm functions, plotting functions, differentials and basics of integration. CO2: Understand basics of vector calculus. CO3: Understand divergence, gradient and curl and their physical interpretation. CO4: Understand divergence theorem, Green's theorem, Stokes' theorem and appreciate its applications. CO5: Understanding Dirac Delta function, probability.

2.	Mechanics	On successful completion of the course students would have: CO1: grasped the knowledge of the fundamentals of different types of frames of references and transformation laws. (Both Galilean and Lorentz). CO2: learned conservation laws of energy and linear and angular momentum and apply them to solve problems. CO3: learned the basics of potentials and fields, central forces and Kepler's laws CO4: familiarize with rotational dynamics. CO5: learned fundamental ideas of special theory of relativity such as length contraction and time dilation and mass –energy invariance.
3.	Physics laboratory-I	Students will have the working experience of : CO1: A working knowledge of fundamental physics and basic mechanics principles. CO2: The ability to identify, formulates, and solve physics problems. CO3: The ability to formulate, conduct, analyzes and interprets experiments in physics. CO4: The ability to use modern physics techniques and tools, including mathematical techniques, graphs and laboratory instrumentation. Co5: Pendulums, sextant, Vanier caliper, screw gauge, traveling microscope, Maxwell needle, flywheel.
4.	Electricity and Magnetism	On successful completion of the course students would have: CO1: Understand the basic concepts of electric and magnetic field, conductors, dielectrics, inductance and capacitance. CO2: Gain knowledge on the vector analysis CO3: Understand the concept of electrostatics CO4: Understand the concept of Magnetism CO5: Gain knowledge on electromagnetic induction and its applications.
5.	Waves and Optics	After successful completion of the course, the student is expected to have a basic knowledge of CO1: Understand simple harmonic motion and wave motion. CO2: Understand phenomenon based on light and related theories. CO3: Understand the phenomena like reflection, refraction, interference, diffraction, polarization etc and their applications. CO4: Understand the phenomena of interference and working of interferometers. CO5: Understand the resolving power of different optical instruments.
6.	Physics Lab-II	Students will have the working experience of : CO1: A working knowledge of fundamental physics and basic mechanics principles. CO2: The ability to identify, formulates, and solve physics problems. CO3: The ability to formulate, conduct, analyzes and interprets experiments in physics. CO4: The ability to use modern physics techniques and tools, including mathematical techniques, graphs and laboratory instrumentation. Co5: Meldes experiment, angle of prism, refractive index of medium, Micheloson Interferometer, Newton Rings, Fresnel Biprism

Programme specific outcome (PSO)

(B.Sc.-II Physics Honors)

The B.Sc.-II (Physics Honors) Program includes two core courses such as Thermal physics, digital system and applications. The programme aims to develop the following abilities.

PSO1: Students will demonstrate proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics and other sciences.

PSO2: The foundation for the higher education such as M.Sc. in sciences is developed, as thermal physics along with digital and Analog systems are the foremost important subjects of pure and applied sciences.

PSO3: Perform experiments and interpret the results of observation, which includes making an assessment of experimental uncertainties.

Course specific outcome:

S No.	Subject Name	Outcome
1.	Mathematical Physics (II)	On successful completion of the course students would have grasped the knowledge of CO1: Fourier Series, CO2: Frobenius Method and Special Functions, CO3: Some Special Integrals CO4: Errors, CO5: Partial Differential Equations.
2.	Thermal Physics	After successful completion of the course, the student is expected to : CO1: become familiar with various thermodynamic process and work done in each of these processes. CO2: have a clear understanding about reversible and irreversible process and also working of a Carnot engine, and knowledge of calculating change in entropy for various processes. CO3: realize the importance of thermodynamical functions and their applications CO4: Understand the Maxwell Thermodynamical relations. CO5: Understanding Kinetic theory of gases and molecular collisions

3.	Analog Systems and Applications	After successful completion of the course, the student is expected to CO1: have a basic knowledge Semiconductor diodes CO2: Two-terminal Devices and their Applications. CO3: Bipolar Junction transistors CO4: Amplifiers, Operational Amplifiers and their applications. CO5: Oscillators
4.	Physics Laboratory	Students will have the experience on working with: CO1: practicals based on Mathematical Physics CO2: Practicals based on Thermal Physics CO3: Practicals based on Analog systems and Applications
5.	Computational Physics Skills	After successful completion of the course, the student is expected to have a basic knowledge of CO1: Algorithms and Flowcharts CO2: Scientific Programming i.e Fortran CO3: Control Statements CO4: Hands on Fortran Programming
6.	Environmental and road safety awareness	The field of environmental science can be divided into three main goals, which are to learn CO1: Introduction to Environmental studies and Eco systems CO2: Natural Resources and Bio Diversity CO3: Environmental Pollution and policies CO4: Road Safety awareness CO5: Field work based on various environment related programmes
7.	Mathematical Physics (III)	On successful completion of the course students would have :grasped the knowledge of CO1: Complex Analysis CO2: Cauchys Riemann conditions CO3: Integral Transforms CO4: Laplace Transforms CO5: Applications to Laplace Transforms
8.	Digital system and applications	After successful completion of the course, the student is expected to CO1: have a basic knowledge of CRO. CO2: acquire knowledge about integrated circuits. CO3: acquire knowledge about Digital circuits CO4: know about various methods of Boolean algebra CO5: know about Arithmetic circuits, Sequential circuits and Timers.
9.	Elements of Modern Physics	After successful completion of the course, the student will be able to understand CO1: Basics of Quantum Mechanics CO2: Uncertainty Principle and its applications CO3: Operators, Eigen functions and Schrodinger wave equation. CO4: Basics of Laser Physics CO5: Types of Lasers

10.	Physics lab	Students will have the experience on working with: CO1: Practicals based on Mathematical Physics CO2: Practicals based on Elements of Modern Physics CO3: Practicals based on Digital systems and Applications
11.	Basic Instrumentation Skills	After successful completion of the course, the student will be able to understand CO1: Basics of measuring instruments like multimeter, voltmeter CO2: Cathode Ray Oscilloscope CO3: Signal Generators and Instruments CO4: Impedence Bridges CO5: Digital Instruments

Programme specific outcome (PSO)

(B.Sc.-III Physics Honors)

At the completion of B. Sc. in Physics:

PSO1: Students will demonstrate proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics.

PSO2: Students will demonstrate knowledge of classical mechanics, electromagnetism and modern physics and be able to apply this knowledge to analyze a variety of physical phenomena.

PSO3: Students will show that they have learned laboratory skills, enabling them to take measurements in a physics laboratory and analyze the measurements to draw valid conclusions.

Course specific outcome:

S.No.	Subject Name	outcome
1.	Solid state Physics	After successful completion of the course, the student is expected to have knowledge about : CO1: The crystal structures CO2: Elementary lattice dynamics and magnetic properties of matter CO3: Dielectric properties of materials CO4: Elementary band theory CO5: Superconductivity
2.	Quantum Mechanics and its Applications	After successful completion of the course, the student is expected to gain knowledge about: CO1: the basics of formalism of wave mechanics CO2: gain knowledge about Uncertainty Principle CO3; Schrodinger Wave equation CO4: Atom with one valence electron CO5: Many electron atoms
3.	Experimental techniques.	After successful completion of the course, the student is expected to have knowledge about: CO1: Measurements and errors in various physical quantities. CO2: Signals and systems CO3: Methods of Shielding and safety grounding

		CO4: Transducers CO5: Industrial instrumentation: working, efficiency and their applications.
4.	Nuclear physics	After successful completion of the course, the student is expected to have knowledge about CO1: General properties of nuclei and Nuclear Models CO2: Radioactivity Decays and Nuclear reactions CO3: Interaction of Nuclear Radiations with Matter CO4: Nuclear Detectors and accelerators CO5: Particle Physics
5.	Physics Laboratory	Students will have the working experience of : CO1: Experiments based on Nuclear Physics CO2: Experiments based on Quantum Mechanics CO3: Experiments based on Magnetic and semi conductor Materials.
6.	Electromagnetic theory	After successful completion of the course, the student is expected to have knowledge about : CO1: Maxwell equations CO2: EM wave propagation CO3: Polarization of EM waves CO4: Wave Guides CO5: Optical Fibres
7.	Statistical mechanics	After successful completion of the course, the student is expected to gain knowledge about: CO1: Classical Statistics CO2: Basics of Phase space and entropy CO3: Bose Einstein Statistics CO4: Fermi Dirac Statistics CO5: Applications of BE and FD Statistics
8.	Particle Physics	After successful completion of the course, the student is expected to have knowledge about CO1: Elementary Particles CO2: Detailed description of Quarks CO3: Cosmic Rays CO4: Strange Particles CO5: Black Holes and neutron stars
9.	Atomic and Molecular Physics	After successful completion of the course, the students will be able to understand CO1:Hydrogen and Alkali Spectra CO2: Complex Spectra CO3: Infrared and Raman Spectra CO4: Electronic Spectra CO5: Harmonic and An harmonic Oscillators
10.	Physics lab	Students will have hand on experience of : CO1: experiments based on Statistical mechanics and Atomic and Molecular Physics CO2: Arduino Based programs and Experiments