DEPARTMENT OF PHYSICS
M.Sc. Physics

Course Outcomes

On the successful completion of the course, students will be able to

Course Code	Course Name	Course outcomes
20PPHC1	Classical and Statistical Mechanics	CO1:Gain knowledge and understanding of lagrangian and hamiltonian formulations of mechanics and to apply them to simple systems
		CO2:Analyse the new problem and application techniques of classical mechanics
		CO3:Get clear understanding of recent intricate theories rigid body dynamics & small oscillations
		CO4: Understand the concept of statistical mechanics
		CO5:Apply the concepts of statistical mechanics to various physical phenomena
20PPHC2	Quantum Mechanics-I	CO1:Gain good understanding of the formalism of Quantum Mechanics
		CO2:Evaluate Eigen values and Eigen functions for descrete level
		CO3:Develop deep knowledge of angular momentum
		CO4:Apply the most appropriate approximation method for solving specific problem
		CO5:Calculate the rate of transition using time–dependent perturbation theory
20PPHC3	Advanced Electronics	CO1:Know the uses of operational amplifiers
		CO2:Understand the astable, monostable multivibrators and Schmitt trigger circuit using IC 555
		CO3: Acquire knowledge in combination and sequential logic digital circuits and apply the electronic circuit principles.
		CO4:Learn and understand the Conversion of Digital to Analog, and Analog to Digital Conversion
		CO5: Impart the knowledge about different types of Memories devices.
20PPHC4	Electromagnetic Theory	CO1: Acquire the knowledge on fundamental concepts of electric and magnetic fields.
		CO 2: Formulate potential within electrostatics magneto statics and stationery current distributions in linear, isotropic media
		CO3: Interpret the deeper meaning of the Maxwell equations, formulate and solve electromagnetic Problems
		CO4: Master the technique of deriving and evaluating formulae for the electromagnetic fields from very general charge and current distributions
		CO5: Calculate the electromagnetic radiation from radiating systems

20PPHQC1	Core Practical – I	CO1:Apply theory of electronics to design arithmetic , logical and oscillator circuits and analyze the experimental data and develop skills in using instruments like multimeters, function generator and Oscilloscopes
		CO2: Acquire knowledge to form Cornus Elliptical fringes in microscope and verify Young's modulus of a glass plate
		CO3: Develop logical thinking skills through digital experiments and apply it to solve physical problems
		CO4: Acquire profound knowledge in physics concepts by doing laboratory experiments and interpreting the results.
		CO5: Gain knowledge to make hydrogen arc spectrum
20PPHC5	Analytical Methods of Physics	CO1:Know the basic concept of tensors and their applications in physical systems.
		CO2: Understand the elements of complex variable and evaluate problems related to definite integrals.
		CO3: Understand the properties of special functions that are essential tools to solve the problems in various fields of Physics.
		CO4: Summarize the concepts of group theory and apply it to solve mathematical problems of interest in physics.
		CO5: Understand and use the delta and green's functions for describing physical systems.
20PPHC6	Microprocessor and Microcontroller	CO1: Understand and apply the Concept of multiplexing in microprocessor, processor cycles, machine cycles of 8085, Instruction format of 8085 and multiprogramming.
		CO2: Understand and apply the interrupts of 8085, software interrupts of 8085, hardware interrupts of 8085, priorities of interrupts enabling, disabling and masking of 8085. Analyse the keyboard and display interfacing.
		CO3: Apply, Impart and create the assembly language programs and program to search the smallest data in an array.
		CO4: Apply, create and gain knowledge in the field of the Peripheral devices.
		CO5: Apply, create and gain knowledge in the field of the 8086 Microprocessor Internal Architecture, programming the 8086, Addressing modes of 8086.
20PPHC7	Condensed Matter Physics	CO1: Provide an in–depth knowledge of structure of Solids
		CO2: Know the basics of bonding, lattice vibrations and free electron theory of solids
		CO3: Acquire deep understanding in the field of material science
		CO4: Emphasize the applications of superconductors in Industry
		CO5: Understanding the concepts of crystallography.

20PPHEC1	Energy Physics	CO1: Acquire basic knowledge on renewable energy Resources
		CO2: Study the principle and performance of harnessing solar and other alternative energy sources
		CO3: Implement the solar energy in various applications like solar heating, cooling, cooking, etc.,
		CO4: Collect the various energy sources like wind Energy
		CO5: Apply the basic physical concepts to develop the conversion technologies like wet process, dry process and photosynthesis
20PPHQC2	Core practical -II	CO1: Acquire knowledge to design and analyze digital and electronic circuits
		CO2: Understand and apply the knowledge of theory like properties of matter, light and dielectrics to experiments
		CO3: Apply physics principle to validate the experimental results and develop skills in using instruments like microscope, multimeters, function generator and oscilloscope
		CO4: Apply logical thinking skills to write the program in 8085 microprocessor and verify the results
		CO5: Apply the theory of Op– amp to design filter circuits design and analyze logical circuits
20PHRSC	Human Rights	CO1: To teach the value of Human Rights.
		CO2: To provide knowledge on the fundamental rights and directive principles of the constitution.
		CO3: To create an awareness on the civil and political rights.
		CO4: To summarise the economic rights.
		CO5: To analyse the importance of women’s rights.

19PPHC8	Quantum Mechanics II	CO1: Describe the concept of identical particles and learn to apply the concepts of quantum mechanics quantitatively to predict the behavior of identical particles.
		CO2: Apply integral / residual approach to simple problems using Born's Approximation, Partial Wave Approximation, Green's Function and evaluate total scattering cross– section.
		CO3: Compare and contrast atom field interaction with classical and quantum theory of radiation.
		CO4: Understand approximations in atomic and molecular structure.
		CO5: Understand relativistic effects in quantum mechanics and Apply the theory of Matrices / Tensors to the behaviour of elementary particles due to relativistic corrections under different situations.
19PPHC9	Spectroscopy	CO1: Understand the significance of microwave spectroscopy and have knowledge on the techniques and instrumentation of microwave spectroscopy. Analyse the different types of spectroscopic importance.
		CO2: Apply the basic concepts IR and Raman. Spectroscopy in structure and functional group determination apply the principle of Raman spectroscopy and its applications in the different field of science & technology
		CO3: Understand the theory and practise electronic spectra of molecules. Apply the knowledge to interpret the spectra of the samples and solving molecular Problems
		CO4: Gain knowledge about fundamentals of NMR and ESR spectroscopy and understand the basics of NMR spectroscopic techniques and apply it in to hospital for solving society problem.
		CO5: Understand the physic–chemical techniques of Mossbauer and NQR spectroscopy. Apply this technique in analyzing the properties of matter
19PPHEC2	Instrumentation	CO1: Know and apply the basic concepts of transducers and their applications
		CO2: Understand, apply and analyse the techniques of digital instrumentation microscopy instrumentation
		CO3: Impart and master the basic principles of analytical instrumentation
		CO4: Gain knowledge and analyse the principle, working function of ECG and EEG field of the biomedical instrumentation
		CO5: Summarise the concepts of computer peripherals

19PPHEC3	Materials Science	CO1: Create the ability to identify, recognize and classify imperfections found in crystals
		CO2: Know various types of magnetic materials and applications.
		CO3: Understand the optical and electrical properties of materials.
		CO4: Acquire knowledge on thermal properties of solids.
		CO5: Impart the knowledge about nanomaterials and to understand the potential applications of nanotechnology.
19PPHQC3	Core Practical -III	CO1: Make measurements, analyze and interpret the experimental data with techniques of advanced general Experiments
		CO2: Use the 8085 microprocessor for interfacing devices
		CO3: Acquire hands on experience of handling and building electronics circuits
		CO4: To apply the C language to solve problems in Physics
19PPHEDC	Communication Systems	CO1: Understand the various modulation techniques and distinguish between FM, AM and PM. Analyse and determine the performance of transmitter and receiver circuits.
		CO2: Understand the principles of Radar communication system and colour television operation
		CO3 : Recall knowledge of mobile communication standard, its architecture, logical channels, advantages and limitations
		CO 4: Apply the basic physical concepts on satellite communication. Understand the orbital and functional principles of satellite communication systems
		CO5: Identify and characterize different components of an optical fiber communication link
19PPHC10	Nuclear and Particle Physics	CO1: Demonstrate the knowledge of fundamental aspects of the nuclear structure and outline their theoretical descriptions to explore the nuclear stability and to solve problems.
		CO2: Understand the deuteron behavior at ground and excited states and apply deuteron physics and the Nucleon–Nucleon scattering for explaining the nuclear forces.
		CO3: Analyses the differences between various nuclear decay modes, state selection rules, and determine whether a given decay can take place
		CO4: Compare and contrast different nuclear models, explain the need of standard model and its limitations

		CO5:Gain knowledge on elementary particles, symmetry in baryon decuplets and octets for J^P states and acquire familiarity with the fundamental constituents of matter (quarks, leptons and gluons); know their quantum characteristics and apply conservation laws to nuclear reactions
19PPHEC4	Communication Electronics	CO1: Understand the concept of radiation through mathematical formulation and measure the antenna parameters
		CO2: Understand the principle and generation of microwaves. Analyse various microwave parameters
		CO3: Identify source coding and channel coding schemes for a given communication link and also to evaluate the performance of PCM and MODEM in a digital communication system
		CO4: Understand the principles of radar communication system and colour television operation. Analyze and determine the performance of television transmitter and receiver circuits
		CO5: Analyse and apply an appropriate modulation, multiplexing, coding and multiple access schemes for a given satellite communication link
19PPHEC5	Optoelectronics	CO 1: Acquire the basic knowledge in Fibre optic communications and able to solve basic problems
		CO2: Understand the various losses in Fibre optic cables
		CO3: Analyze the working and applications of OTDR
		CO4: Develop deep knowledge on the role of optical fibre communication systems
		CO5: Apply knowledge of optoelectronic devices in light sources
19PPHQC4	Core Practical - IV	CO1: Make measurements, analyze and interpret the experimental data with techniques of advanced general experiments
		CO2: Evaluate and compare magnetic properties and magnetic behavior of magnetic materials
		CO3: Able to interface different programmable devices with 8085 microprocessor and 8051 microcontrollers
		CO4: Design and analyze electronic circuits
		CO5: Apply the C language to solve problems.

19PPHPC	Project and Project Viva- Voce	CO1: Explain the significance and value of problem in physics to both scientific and societal communities
		CO2: Design and carry out scientific experiments as well as accurately record the results
		CO3: Critically analyse and evaluate experimental strategies, and decide which is most appropriate for answering specific questions
		CO4: Research and communicate scientific knowledge in the context of a topic related to condensed matter physics/Nuclear/High Energy Physics, in oral, written and electronic formats
		CO5: Explore new areas of research in physics and allied fields of science and technology