DEPARTMENT OF PHYSICS
P.G.

DEPARTMENT OF PHYSICS-PG

Programme Code: PP **Programme Name: M.Sc. Physics**

Programme Outcomes

1. Coherent understanding of academic field of Physics through laboratory experiments. (National)
2. Acquire knowledge to analyse and solve advanced problems in Physics. (Global)
3. Ability to carry out advanced tasks and projects successfully. (National)
4. Acquiring recent knowledge towards the research. (Global)
5. Developing research skill provides them to work in scientific and in research laboratories (Global)

Programme Specific Outcomes

1. Develop experimental and data analysis skills through a wide range of advanced level Physics experiments. (Global)
2. Acquire subject knowledge and skills of the calibre sought by industry, as well as provides academic teachers and researchers of the future. (National)
3. Trained to evolve new technologies in their own discipline (National)
4. Learning research skills which includes advanced laboratory techniques. (National)
5. Understand the skills of independent investigation of Physics related problems. (Global)

Course Outcomes

SEMESTER - I

Subject Code: 18PP11
Course Name: MATHEMATICAL PHYSICS-I (Global)

Upon completion of the course, the students will be able to

1. Acquire knowledge on the Mathematical basis of vectors and their application in Physics problems.
2. Gain knowledge on the concept of eigen vectors and eigen values and their physical meaning
3. Analyze the problems using different methods of special function

Subject Code: 18PP12
Course Name: CLASSICAL MECHANICS (Global)

Upon completion of the course, the students will be able to

1. Understand the mechanics systems of particles and apply the Lagrangian to solve the macroscopic physical problems.
2. Apply the Hamiltonian's formalism for solving the macroscopic physical problems.
3. Analyze the system using Hamilton – Jacobi Theory.

Subject Code: 18PP13
Course Name: ADVANCED ELECTRONICS (Global)

Upon completion of the course, the students will be able to

1. Understand the working of different semiconductor devices and operational amplifiers.
2. Gain the knowledge of Digital to Analog conversion, Analog to digital conversion technique and corresponding circuits.
3. Learn to design Flip flops and counters.

Subject Code: 18PPE1A
Course Name: NUMERICAL METHODS (Global)

Upon completion of the course, the students will be able to

1. Obtain knowledge on the algebraic and transcendental equations.
2. Familiarize the knowledge about Interpolation of Forward, Backward and central differences.
3. Acquire knowledge about the Least squares, B-splines, Numerical differentiation and integration.

Subject Code: 18PPE1P
Course Name: PROGRAMMING IN C++ (National)

Upon completion of the course, the students will be able to

1. Get a wide knowledge about Principles of OOP, Tokens, Expressions and Control Structures.
2. Learn the knowledge on the Inheritance and Pointers.
3. Managing console I/O Operations, Files.

SEMESTER - II

Subject Code: 18PP21
Course Name: MATHEMATICAL PHYSICS-II (Global)

Upon completion of the course, the students will be able to

1. Use the characteristics of complex function the method of Cauchy integral theorem, Taylor's and Laurent's series.
2. Evaluate residues and definite integrals.
3. Apply the concepts of tensor analysis and tensor calculus to formulate physical laws and simplify them using coordinate transformation.

Subject Code: 18PP22
Course Name: THERMODYNAMICS AND STATISTICAL MECHANICS (Global)

Upon completion of the course, the students will be able to

1. Acquire knowledge about different laws of thermodynamics.
2. Focus on the concept of phase space and its volume.
3. Learning the uses of partition function for calculations about the canonical ensemble.

Subject Code: 18PP23
Course Name: ELECTROMAGNETIC THEORY (Global)

Upon completion of the course, the students will be able to

1. Know about the basics of Electrostatics and Magneto statics.
2. Learn the use of the Maxwell's equations, role of gauge transformations, scalar and vector potentials.
3. Acquire the knowledge of the propagation of EM waves in waveguides.

Subject Code: 18PP21P
Course Name: PRACTICAL-I GENERAL EXPERIMENTS (Global)

Upon completion of the course, the students will be able to

1. Design the experiments and verify the theoretical concepts.
2. Gain the knowledge to handle the Data and error analysis.
3. Learn about the Physical experiments and also computational methods.

Subject Code: 18PP22P
Course Name: PRACTICAL-II ELECTRONICS (Global)

Upon completion of the course, the students will be able to

1. Familiarize with applications of zener diode and IC voltage regulators.
2. Designing amplifier, oscillator and wave shaping circuits for defined specifications.
3. Significance of various devices which are beneficial to understand how they will operate and use.

Subject Code: 18PPE2A
Course Name: INSTRUMENTATION (Global)

Upon completion of the course, the students will be able to

1. Introducing the concepts of measuring instruments of the different meters.
2. Explicate the construction and working of various recorders.
3. Apply the complete knowledge of various transducers to measure the physical quantities in the field of science ,engineering and technology.

Subject Code: 18PPE2P
Course Name: MEDICAL PHYSICS (Global)

Upon completion of the course, the students will be able to

1. Develop medical Physics methods and tools related to Physics, radiation biology and radiation detection and computation in research setting.
2. Learn the instrumentation techniques of bio potential recorders.
3. Acquire the understanding of the working of operation theatre equipments.

SEMESTER - III

Subject Code: 18PP31
Course Name: SOLID STATE PHYSICS I (Global)

Upon completion of the course, the students will be able to

1. Get a brief idea about crystalline and amorphous substances, about lattice, unit cell, concept of Brillouin zones and diffraction of X-rays by crystalline materials.
2. Gain the wide view about phonons and its importance.
3. Enhance the idea about Semiconductor Crystals and their properties.

Subject Code: 18PP32
Course Name: QUANTUM MECHANICS I (Global)

Upon completion of the course, the students will be able to

1. Study the postulates of Quantum mechanics and understand the concepts one dimensional problem.
2. Grasp the concepts of angular momentum operators, Eigen values and matrix.
3. Acquire the knowledge of relativistic Quantum Mechanics.

Subject Code: 18PP33
Course Name: NUCLEAR PHYSICS (Global)

Upon completion of the course, the students will be able to

1. Acquire the basic aspects of nuclear reactions, the Q-value of reaction and known to measure the nuclear size from Rutherford scattering.
2. Gain the knowledge about the Nuclear Fission and Fusion.
3. Comprehend the Elementary particle and classification of Elementary particle.

Subject Code: 18PPE3A
Course Name: NANO PHYSICS (Global)

Upon completion of the course, the students will be able to

1. Grasp the principles, fabrication and design of carbon nano tubes and their application.
2. Apprehend the theoretical and experimental aspects of quantum wells, wires and dots.
3. Realize the techniques of nano machines and nano devices, expected to provide the necessary understanding in nanotechnology.

Subject Code: 18PPE3B
Course Name: SOLAR ENERGY (National)

Upon completion of the course, the students will be able to

1. Learning the fundamentals of solar energy technologies.
2. Evaluate the concept of solar thermal technology for process heating applications.
3. Measure and evaluate different performance testing of solar collectors.

SEMESTER - IV

Subject Code: 18PP41
Course Name: SOLID STATE PHYSICS II (Global)

Upon completion of the course, the students will be able to

1. Apprehend the basic idea about superconductors and their classifications.
2. Gain the basic idea about Plasmons, Polaritons, Polarons and Excitons.
3. Recognize the defects and their types in crystals.

Subject Code: 18PP42
Course Name: QUANTUM MECHANICS II (Global)

Upon completion of the course, the students will be able to

1. Grasp the concept of perturbation and transition probability.
2. Study the consequence of Relativistic wave equation.
3. Discuss the identical particles and spin matrices.

Subject Code: 18PP43
Course Name: MOLECULAR SPECTROSCOPY (Global)

Upon completion of the course, the students will be able to

1. Obtain the knowledge of microwave and IR Spectroscopy.
2. Demonstrate an understanding the concept of Raman Spectroscopy and its application.
3. Wide knowledge on the concept of electronic spectra of molecules.

Subject Code: 18PP41P
Course Name: PRACTICAL-III GENERAL PHYSICS (Global)

Upon completion of the course, the students will be able to

1. Acquire the knowledge of experimental Physics.
2. Improve the analytical and observation ability of Physics experiments.
3. Analyze the various physical properties such as optical, electrical and magnetic properties using experimental observations.

Subject Code: 18PPPR4
Course Name: PROJECT (National)

Upon completion of the course, the students will be able to

1. Develop the skill to plan, execute and report the results of an experimental and theoretical Physics based project in research work.
2. Acquire the knowledge in the inter disciplinary project.
3. Make out the innovative ideas in research work.

Subject Code: 18PPE4A
Course Name: MICROPROCESSOR (Global)

Upon completion of the course, the students will be able to

1. Comprehend the structure and working of 8085 microprocessor.
2. Learning the looping ,counting and indexing.
3. Recognize 8085 BCD to Binary conversion and 8085 Interrupts.

Subject Code: 18PPE4B
Course Name: CRYSTALLOGRAPHY (Global)

Upon completion of the course, the students will be able to

1. Analyze the methods involved in crystal structure determination.
2. Gain the knowledge of different methods of recording X-ray diffraction.
3. Explore the applications of crystallography to study the structures of Molecules.