DEPARTMENT OF PHYSICS
MSc PHYSICS
PROGRAMME OUTCOME

- Acquire detailed understanding of the important theoretical frame work of physics Using Classical mechanics, Quantum Mechanics, Mathematical Physics and Statistical mechanics to understand and analyze various branches of physics including Electronics, Optics, Electromagnetic theory, Condensed matter physics, Nuclear Physics, Particle Physics, Spectroscopic methods, etc.
- Skill in experimentation Achieve experimental and data analysis skills from two general physics Lab courses and two Electronics Lab courses.
- Numerical computation techniques Familiarization with modern numerical methods for the analysis of problems in physics.
- Problem Solving and Analysis Acquire the skills to analyze and solve a physics problem using theoretical, experimental or numerical methods. Undertake a project work that gives a hands-on experience in research.

THE OUTCOMES OF THE COURSES OFFERED BY THE DEPARTMENT OF PHYSICS

PH 211: CLASSICAL MECHANICS

Learn Lagrangian mechanics, analyse two-body central force problem, small oscillations and rigid body dynamics. Learn Hamiltonian mechanics and Hamilton-Jacobi method Learn Special and General theories of Relativity. Acquire preliminary knowledge of nonlinear dynamics and chaos

PH 212: MATHEMATICAL PHYSICS

Develop detailed knowledge of Linear algebra, Complex analysis, Fourier Series and Tensor analysis. Learn Probability theory, Group Theory and Special Functions. Develop in-depth knowledge of Differential equations and solution methods.

PH 213:BASIC ELECTRONICS

Know common electronic circuits using Diodes, BJTs, FETs, OPAMPs and 555 timer ICs. Familiarization with solid- state devices. Preliminaries of Digital Electronics , Optoelectronics and instrumentations.

PH 221 MODERN OPTICS AND ELECTROMAGNETIC THEORY

Understand and comprehend common topics in modern optics and preliminaries of nonlinear optics, Electromagnetic waves and Relativistic electrodynamics, Radio wave propagation, Transmission lines, waveguides and antennas.

PH 222: THERMODYNAMICS, STATISTICAL PHYSICS AND BASIC QUANTUM MECHANICS

Assimilate and comprehend Thermodynamic relations and Classical and Quantum statistics and understand Phase transitions. Learn Foundations of quantum mechanics, the paradoxes and some

exactly solvable problems in quantum mechanics.

PH 223: COMPUTER SCIENCE AND NUMERICAL TECHNIQUES

Learn basic computer architecture and microprocessors. To attain working knowledge on Python and C++ programming languages. To implement numerical methods in problem solving in physics

PH231: ADVANCED QUANTUM MECHANICS

Learn approximation methods in quantum mechanics, the connection between symmetry and conserved quantities, the angular momentum, and the properties of systems of identical particles. To understand the theory of quantum scattering and learn topics in relativistic quantum mechanics and preliminaries of quantum field theory

PH 232: ATOMIC & MOLECULAR SPECTROSCOPY

Learn and apply general tools of spectroscopy. To enhance understanding of Molecular, rotational, IR, Electronic, Raman, ESR , NMR, Mossbauer, Photo electron and Photo acoustic spectroscopy

SPECIAL PAPER SYLLABUS:

SPECIAL PAPER -I PH 233 E:

ADVANCED ELECTRONICS -I

Learn Radio and microwave communications and Pulse modulation. To understand the fundamentals of digital communications, optical fiber communication, mobile cellular communications and Digital signal processing

PH 241: CONDENSED MATTER PHYSICS

Learn crystal structure, lattice vibrations and free electron and band theories. Learn semiconductors, Dielectric and Magnetic properties of matter and superconductivity.

PH242: NUCLEAR AND PARTICLE PHYSICS

Learn Nuclear forces, nuclear models and nuclear reactions To understand details of Nuclear fission and fusion, Nuclear detectors, particle accelerator and Elementary particle physics

SPECIAL PAPER SYLLABUS :

SPECIAL PAPER –II PH 243 E:

ADVANCED ELECTRONICS-II

Knowledge of Microprocessors, interfacing and embedded systems. To understand preliminaries of artificial intelligence, Television, Radar and satellite communications.

PH 251: GENERAL PHYSICS PRACTICALS

Learn experimental

techniques in general physics

Learn analysis of data and

error estimation

PH 252 ELECTRONICS AND COMPUTER SCIENCE PRACTICALS

Learn construction of analog electronic circuits

and c ++programming

PH 261: ADVANCED PHYSICS PRACTICALS

Learn advanced experimental techniques in general physics

PH 262:ADVANCED ELECTRONICS PRACTICALS

Learn construction an implementation of analog and digital circuits along with microprocessors.

PH201: PROJECT

Undertake a project work that gives a hands-on experience in research and solving physics problem using theoretical, experimental or numerical methods.

PH202: VIVA VOCE

To evaluate the understanding of the important theoretical frame works of physics.