

## Programme : M.Sc.-Physics

### Course Outcomes of Course “Methods of Mathematical Physics – I and II”

- CO1. Understand the application of Vector analysis and curvilinear coordinates and Generalized Coordinates.
- CO2. Analyze the application of Matrices and complex variables.
- CO3. Use of Partial differential equations and Boundary value problems –solutions.
- CO4. Understand the use of Bessel Functions Legendre Polynomials and Hermite Polynomials.
- CO5. Demonstrate the theory and application of Tensor analysis, and Tensor algebra.
- CO6. Know Fourier series, Laplace Transforms and its applications.
- CO7. Describe Greens function and Integral Equations.
- CO8. Understand the use of Groups.

### Course Outcomes of Course “Quantum Mechanics I and II”

- CO1. Understand General formulation of quantum mechanics.
- CO2. Demonstrate Fundamental postulates of Quantum mechanics.
- CO3. Know Stationary states and Eigen value problems.
- CO4. Get knowledge of Angular momentum, Parity and Scattering.
- CO5. Understanding theory and applications of Matrix formalism of quantum mechanics .
- CO6. Understanding of Quantum dynamics.
- CO7. Knowledge to apply Approximation methods.
- CO8. In-depth knowledge on Relativistic quantum mechanics and elements of second quantization and Transition from particle to field theory.

### Course Outcomes of Course “Classical Mechanics”

- CO1. Understand System of Particles.
- CO2. Know Hamiltonian Formalism.
- CO3. Define Central Forces, Scattering in Central Force Field, Motion in a non inertial reference frames.
- CO4. Demonstrate Rigid body dynamics and Small Oscillations.

### Course Outcomes of Course “Electrodynamics”

- CO1. Explain theory and applications of Electrostatics and Magneto statics.
- CO2. Demonstrate theory and applications of Electromagnetic waves.
- CO3. Analyze theory and applications of Electromagnetic Radiation.
- CO4. Define theory and applications of Plasma Physics.

### Course Outcomes of Course “Condensed Matter Physics and Electronics”

- CO1. Define theory and applications of Elementary Crystallography and X-ray diffraction Elementary Crystallography.
- CO2. Explain theory and applications of Free Electron Theory and Band Theory of Solids.
- CO3. Demonstrate theory and applications of Phasors and devices.
- CO4. Understand theory and applications of Operational amplifiers and Digital electronics.

### Course Outcomes of Course “Energy Studies”

- CO1. Gaining knowledge on Renewable energy resources.
- CO2. Understanding the Basics of the Wind energy.
- CO3. Know Biomass Energy and Biogas Technology.

### Course Outcomes of Course “Atomic and Molecular Physics”

- CO1. Understanding Spectra of Single and Multi Electron Atoms.
- CO2. Demonstrate X-ray Spectra and Resonance Spectroscopy
- CO3. Understand Microwave spectra, infra red spectra and Raman Spectroscopy.
- CO4. Explain Electronic spectroscopy: Electronic Spectra of Diatomic Molecules.

### **Course Outcomes of Course “Thermodynamics and Statistical Physics”**

- CO1. Explain theory and uses of Thermodynamics.
- CO2. Define theory and uses of Classical statistics.
- CO3. Demonstrate theory and uses of Quantum Statistics and Fluctuations.
- CO4. Have an insight into theory and uses of Brownian Motion and Time Dependence of Fluctuations.

### **Course Outcomes of Course “Condensed Matter Physics - I and II”**

- CO1. Gain in-depth knowledge of Crystallography.
- CO2. Gain knowledge of elastic properties and thermal properties.
- CO3. Understand electric and Ferroelectric properties of solids.
- CO4. Define Optical Properties of Solids.
- CO5. Understanding Band Theory of Solids.
- CO6. Gain knowledge on Transport Properties.
- CO7. Explain Semiconductors and their types.
- CO8. Understand use of Optoelectronic Devices.

### **Course Outcomes of Course “Electronics - I and II”**

- CO1. Understand Printed Circuit Board Design Techniques and IC Fabrication Technologies.
- CO2. Understand characteristic and simple applications of special Semiconductor Devices and Amplifiers.
- CO3. Explain OPAMP.
- CO4. Understand digital IC technologies and Interfacing different Logic Families.
- CO5. Gain knowledge on Transmission lines
- CO6. Understand Wave Guides and Antenna.
- CO7. Get in-depth knowledge of Analog Modulation and Demodulation.
- CO8. Understand Microwave Devices and Satellite Communications.

### **Course Outcomes of Course “Nuclear Physics—I and II”**

- CO1. Understand Interaction of particulate radiations and radiation dosimetry.
- CO2. Gaining knowledge on nuclear detectors.
- CO3. Explain the concepts of nuclear electronics.
- CO4. Know Particle accelerators and Applications.
- CO5. Gain knowledge on Nuclear spectroscopy
- CO6. Explain the concepts of Heavy Ion Physics.
- CO7. Gain knowledge on Review of deuteron problem and Nuclear Forces and Scattering.

### **Course Outcomes of Course “Radiation Source and Hazards”**

- CO1. Understand Radiation Sources, Gamma chamber, Particle Accelerators.
- CO2. Explain the concepts of Radiation Biophysics Basic aspects of Cell Biology and Physiology.
- CO3. Define Radiation Hazard, Evaluation, Control and Radiation Protection and Radiation Protection Standards.

### **Course Outcomes of Course “Lasers, Vacuum Techniques and Cryogenics”**

- CO1. Understand Lasers and non-linear Optics.
- CO2. Know Holography and Non-linear optics.
- CO3. Learn Vacuum Techniques.
- CO4. Demonstrate Cryogenic Techniques and its Applications.

### **Course Outcomes of Course “Astrophysics and Relativity”**

- CO1. Gain knowledge on Astrophysics, Asteroids, Comets and Meteorites.
- CO2. Understand Energy generation in stars. Contents of milky way galaxy.
- CO3. Explain Theory of Relativity and its Application.
- CO4. Understand General relativity Concepts.

### **Course Outcomes of Course “Condensed Matter Physics – III and IV”**

- CO1. Understand theory and applications of Ferromagnetism.
- CO2. Demonstrate Theory and Applications of Anti-Ferro and Ferrimagnetisms.
- CO3. Analyze Paramagnetic Relaxation and Magnetic resonance, Nuclear Magnetic Resonance (NMR).
- CO4. Understand Nanomaterials and Nanostructures
- CO5. Explain Crystal Defects.
- CO6. Understand Thin Films and their Applications.
- CO7. Gain knowledge on Superconductivity.
- CO8. Get an insight into Polymers & Liquid Crystals and their Applications.

### **Course Outcomes of Course “Electronics – III and IV”**

- CO1. Understand basics of Microprocessor and its Architecture.
- CO2. Gain knowledge on programming with 8085.
- CO3. Get an insight into Stack, Subroutines and Interrupts.
- CO4. Know the importance of Peripherals.
- CO5. Gain knowledge on optical fibre communications.
- CO6. Understand Optical Sources and Detectors.
- CO7. Understand Knowledge on Digital Signal Processing.
- CO8. Gain knowledge on DFT and IDFT.

### **Course Outcomes of Course “Nuclear Physics – III and IV”**

- CO1. Know Nuclear models.
- CO2. Gain knowledge on Nuclear shell model and collective model.
- CO3. Get an insight into Nuclear Reactions and Partial Wave Approach.
- CO4. Understand Perturbation approach.
- CO5. Get an insight into Reactor Physics
- CO6. Explain concepts of Neutron Physics.
- CO7. Understand concept of Particle physics.
- CO8. Gain knowledge on Strange particles and weak interactions.