

M.Sc Course Outcome

Sl. No	Course Code	Course Title	Course Objectives	Expected Outcome
1	PHH 401, PHH 451	Methods of Mathematical Physics – I & II	To impart knowledge about various mathematical tools used to study the applied physics problems.	Understanding the application of Vector analysis and curvilinear coordinates and Generalized coordinates.
				Understanding the application of Matrices and complex variables and Complex variables and integral transform.
				The usage of Partial differential equations and Boundary value problems – Solutions.
				Theory and application of Tensor analysis, Fourier series, Groups and

				Green's Functions and Integral Equations.
2	PHH402, PHH452	Quantum Mechanics I & II	TO give exposure about the various tools employed to analyze the quantum mechanical problems and to impart knowledge of advanced quantum mechanics for solving relevant physical problems.	Understanding General formulation of quantum mechanics, Fundamental postulates of QM, Stationary states and Eigen value problems and angular momentum, parity and scattering.
				Understanding theory and applications of Matrix formalism of quantum mechanics, Quantum dynamics.
				Knowledge to apply Approximation methods.
				In-depth knowledge on Relativistic quantum mechanics and elements of second quantization and Transition from particle to field theory.

3	PHH403	Classical Mechanics	To apprise the students to understand classical mechanics and their applications.	Gaining knowledge on System of Particles.
				Gaining knowledge on Hamiltonian formalism.
				Gaining knowledge on Central Forces, Scattering in Central Force Field.
				Gaining knowledge on Rigid body dynamics and Small oscillations.
4	PHH404	Electrodynamics	To apprise the students regarding the concepts of electrodynamics, theory related to motion of charge particle in inhomogeneous field,	Understanding theory and applications of Electrostatics and Magneto statics.
				Understanding theory and applications of Electromagnetic waves.

			Production of plasma and usage of plasma and its use in various situations.	Understanding theory and applications of Electromagnetic Radiation.
				Understanding theory and applications of Plasma Physics.
5	PHH453	Nuclear and Radiation Physics	To impart knowledge about basic Nuclear and Radiation Physics properties and nuclear models for understanding of related reaction dynamics.	Understanding General properties of the nucleus and nuclear decay.
				Understanding Interaction of radiations and radiation detectors.
				Understanding Ionizing radiations and applications.
				Understanding Nuclear reactions and Reactor physics.

6	PHH454	Condensed Matter Physics & Electronics	To study some of the basic properties of the condensed phase of materials especially solids and to introduce students to entire circuit design and to provide in-depth theoretical base of Digital Electronics.	To understand theory and applications of Elementary Crystallography and X-ray diffraction Elementary Crystallography.
				To understand theory and applications of Free Electron Theory and Band Theory of Solids.
				To understand theory and applications of Phasors and devices.
				To understand theory and applications of Operational amplifiers and Digital electronics.
7	PHE455	Energy Studies	Main Objective is ENERGY STUDIES such as Renewable energy resources,	Gaining knowledge on Renewable energy resources. Understanding the Basics of the Wind energy.

			Biomass energy and Biogas technology etc.	
				In-depth information about Biomass energy and biogas technology.
8	PHH501	Atomic and Molecular Physics	Objective of this course is to learn atomic, molecular and spin resonance spectroscopy.	Understanding Spectra of single and multi electron atoms.
				Understanding X-ray spectra and Resonance spectroscopy.
				Understanding Microwave spectra, infra red spectra and Raman spectroscopy
				Understanding Electronic spectroscopy: Electronic spectra of diatomic molecules.

9	PHH502	Thermodynamics and Statistical Physics	The objective of this course is to learn the properties of macroscopic systems using the knowledge of the properties of individual particles.	Understanding theory and uses of Thermodynamics.
				Understanding theory and uses of classical statistics.
				Understanding theory and uses of Quantum statistics.
				Understanding theory and uses of Brownian motion.
10	PHS503, PHS506, PHS553 & PHS556	Matter Physics I ,II, III & IV	To give comprehensive exposure to the students on condensed matter physics related topics.	<p>In-depth knowledge on Crystallography, elastic properties and thermal properties, electric and Ferroelectric properties of solids and optical properties of Solids</p> <p>Understanding Band theory of Solids, Transport properties, Semiconductors, its type etc. and Optoelectric devices.</p>

Theory and applications of Ferromagnetism, Anti-ferro and ferrimagnetisms, paramagnetic relaxation and Magnetic resonance, Nuclear magnetic resonance (NMR) and Nanomaterials and nanostructures.

Study on Crystal defects, Thin films, Superconductivity and Polymers & Liquid crystals.

Understanding Interaction of particulate radiations and radiation dosimetry, Nuclear detectors, Nuclear electronics, Particle accelerators and Applications.

Gaining Knowledge on Nuclear spectroscopy, Heavy ion physics, Review of deuteron problem

11	PHS505, PHS508, PHS555 & PHS558	Nuclear Physics I ,II, III & IV	To gain knowledge about basic nuclear physics properties, fundamental interaction and the range and strength of these interaction with the concept of particle antiparticle or matter antimatter and nuclear models for understanding of related reaction dynamics.	and nuclear forces and scattering.
				Imparting knowledge on Nuclear models, Nuclear shell model, Nuclear reactions and Perturbation approach.
				Gaining knowledge on Reactor physics, Neutron physics, Particle physics, Strange particles and Weak interactions.
12	PHE509	Radiation Sources and Hazards	To impart knowledge on variety of Radiation Sources and its hazards.	Understanding Radiation Sources, Gamma chamber, Particle Accelerators.
				Understanding Radiation biophysics. Basic aspects of cell biology and physiology.
				Understanding Radiation hazard,

				evaluation, control and radiation protection.
				Understanding Radiation protection standards.
13	PHH551	Lasers, Vacuum Techniques and Cryogenics	Understanding theory and applications of Laser, Vacuum Techniques and Cryogenics.	Understanding Lasers and non-linear optics.
				Understanding Holography and Non-linear optics.
				Understanding Vacuum techniques.
				Understanding Cryogenic Techniques.
14	PHH552	Astrophysics and Relativity	Imparting overall knowledge on Astrophysics and Relativity	Gaining knowledge on Astrophysics, Asteroids, Comets and Meteorites.
				Gaining knowledge on Energy

				<p>generation in stars. Contents of Milky way galaxy.</p> <p>Understanding Theory of relativity and its application.</p>
15	PHP405, PHP406, PHP456, PHP457	Physics Practical's I,II,III & IV	Understanding the application of physics theory	Gaining practical knowledge in connection to physics theories.
16	PHP559	Project work	To gain the ability to make links across variety of areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project work.	Students will acquire the ability to make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task. In addition to this, the students will acquire collaborative skills through working in a team to achieve common goals.

17	PHP 512, PHP515	Nuclear Physics Practical's I & II	Aim of Nuclear Physics lab is to train the students for advanced techniques in nuclear physics so that they can investigate various relevant aspects and be confident to handle sophisticated instruments of nuclear physics.	Gaining practical knowledge in connection to Condensed matter Physics theories
18	PHP510 & PHP513	Condensed matter physics practical's I & II	To experimentally realize the structural, optical, magnetic and electric behavior of condensed matters.	Gaining practical knowledge in connection to condensed matter physics theories.