

PROGRAMME SPECIFIC OUTCOMES, PROGRAMME OUTCOMES AND COURSE OUTCOMES

PG & RESEARCH DEPARTMENT OF PHYSICS / B.Sc., (Physics), M.Sc., (Physics) & M.Phil., (Physics)

PSOs	PROGRAMME SPECIFIC OUTCOMES	
PSO1	To identify the fundamental laws for the study of various areas of physics and define and describe them with clarity.	
PSO2	To know the application of principles and concepts of Physics with necessary practical background and assess their consequences..	
PSO3	To explain the basic foundation of the underlying principles and laws of Physics.	
PSO4	To develop critical thinking and quantitative reasoning skills,	
PSO5	To analyze the scientific problems and experiments creatively and critically	
B.Sc., PHYSICS		
B.Sc., (Physics) / UPH22 / PROGRAMMES OUTCOMES		
POs	Description of POs	
PO1	Gaining a broad knowledge of the physical principles of the universe	
PO2	Comprehending the fundamental laws for the study of various areas of physics and define and describe them with clarity.	
PO3	Knowing the application of principles and concepts of Physics with necessary practical background and assess their consequences	
PO4	Discussing, formulating and analyzing the problems and identifying the key concepts and principles to solve them.	
PO5	Evaluating the basic foundation of the underlying principles and laws of Physics.	
PO6	Developing critical thinking and quantitative reasoning skills.	
PO7	Analyzing the scientific problems and experiments creatively and critically.	
B.Sc., (Physics) / UPH22 / COURSE OUTCOMES		
	Description of COs	Bloom's Taxonomy / Cognitive Domain
UPHT11		Properties of Matter
CO1.	Applying knowledge of the properties of matter, thermodynamics, and atomic and nuclear physics to explain natural physical processes and related technological advances.	Application (Level 3)
CO2.	Assessing the contributions of physics to our evolving understanding of global change and sustainability while placing the development of physics in its historical and cultural context.	Evaluation (Level 5)
CO3.	Using an understanding of elementary mathematics along with physical principles	Application (Level 3)
CO4.	Designing experiments and acquire data in order to explore physical principles, effectively communicate results, and critically evaluate related scientific studies.	Synthesis (Level 6)
CO5.	Solving problems encountered in everyday life, further study in science, and in the professional world.	Synthesis (Level 6)
UPHT12		Thermal Physics

CO1.	Understanding the response of solids, liquids and Gases to heat in microscopic and macroscopic level and its heat capacity.	Comprehension (Level 2)
CO2.	Learning and applying about basic concept of heat conduction and various laws of thermo dynamical principles.	Application(Level 3)
CO3.	Understanding of various thermodynamic principles and its related laws	Analysis (Level 4)
CO4.	Designing experiments and acquire data in low temperature physics doing experiments communicate results, and critically evaluate related scientific studies.	Evaluate (Level 5)
CO5.	Applying theoretical concepts of heat in everyday life, and performing thermal conductivity experiments.	Synthesis (Level 6)
UPHT21 Electricity and Magnetism		
CO1.	Acquiring the knowledge of basic concepts of Electricity and Magnetism.	Knowledge (Level 1)
CO2.	Understanding the basic laws of current and magnetism by doing experiments.	Comprehension (Level 2)
CO3.	Applying the concept of Direct and Alternating current in various electrical experiments	Application (Level 3)
CO4.	Analyzing the concept of electromagnetic induction, and critically evaluate related scientific studies.	Analysis (Level 4)
CO5.	Solving problems in everyday life, regarding series and parallel connection of house hold devices	Synthesis (Level 6)
UPHT21 Core Practical -I		
CO1.	Understanding Experimental ideas related to properties of Matter.	Comprehension (Level 2)
CO2.	Identifying the correlation between theory and experiment.	Analysis (Level 4)
CO3.	Applying the property of light and sound to various experiments	Application (Level 3)
CO4.	Designing potentiometer experiments for calibration of Ammeter and Voltmeter.	Evaluation (Level 5)
CO5.	Solving problems and analysing observation and make meaningful conclusions	Synthesis (Level 6)
UPHT31 Mathematical Physics		
CO1.	Describing the mathematical basis of vectors and their application in physics problems.	Comprehension (Level 2)
CO2.	Evaluating the concept of eigenvectors and Eigen values and their physical meaning.	Evaluation (Level 5)
CO3.	Using Matrices and Fourier series numerous physical principles and problems can be solved	Application (Level 3)
CO4.	Analysing the mathematical concepts and tools such as Beeta, Gama functions and partial differential functions to solve numerical problems of physics.	Analysis (Level 4)
CO5.	Describing the usefulness of Fourier series in solving problems associated with periodicity.	Synthesis (Level 6)
UPHA33 Mechanics, Properties of Matter, Electricity, Electronics And Modern Physics		
CO1.	Understanding the motion of objects and attempts to comprehend the laws governing them. laws of motion, concepts of system of particles, dynamics of rigid Bodies and oscillations.	Comprehension (Level 2)
CO2.	Realizing the knowledge of gravitational force between bodies including planets. Comparing the fluid motion, determine the coefficient of viscosity by different method.	Analysis (Level 4)
CO3.	Enhancing the application skills by relating the phenomena of electricity and magnetism with daily	Application (Level 3)

	activities.	
CO4.	Analyzing and applying the concepts of current electricity, transient currents and magnetic materials its types.	Evaluation (Level 5)
CO5.	Understand a broad overview of the various optical instruments. Appreciating the fibre optics phenomena and communication. Solving problems encountered in everyday life, in the professional world.	Synthesis (Level 6)
UPHE31 Fiber Optics		
CO1.	Imparting knowledge about optical fibre and related technological advances.	Knowledge (Level 1)
CO2.	Understanding the synthesis of optical fibre its classification and fibre loss.	Comprehension (Level 2)
CO3.	Using an understanding of elementary mathematics along with physical principles	Application (Level 3)
CO4.	Comparing the optical and electrical properties of optical fibre and studying of transmission characteristics in its communication system.	Analysis (Level 4)
CO5.	Elaborating various sources and detectors used everyday life for further study in science.	Evaluation (Level 5)
UPHS31 Home Appliances		
CO1.	Knowing the physics principles used in frequently used home appliances.	Knowledge (Level 1)
CO2.	Imparting conceptual knowledge and skills regarding simple house hold appliance and its working.	Application (Level 3)
CO3.	Acquiring the knowledge of Electrical wiring, switches and sockets.	Analysis (Level 4)
CO4.	Designing simple electrical connections in home wiring, micro wave oven, Mixer, Grinder and vacuum cleaner.	Synthesis (Level 6)
CO5.	Solving problems encountered in emergency lamp, refrigerator air conditioner and exhaust fans.	Evaluation (Level 5)
UPHS31 Fundamentals of Physics		
CO1.	Understanding the fundamental constituents of atoms and classification of materials based on conductivity.	Comprehension (Level 2)
CO2.	Applying the concept of projectile motion and circular motion and knowing about its velocity and acceleration.	Application (Level 3)
CO3.	Analysing and understanding of Gravitational force, work energy theorem and types of energy.	Analysis (Level 4)
CO4.	Acquiring knowledge about crystal structure, conservation of energy and non conventional energy sources.	Synthesis (Level 6)
CO5.	Solving problems using fundamental knowledge of physical concepts.	Evaluation (Level 5)
UPHT41 Solid State Physics		
CO1.	Understanding of the basics of fundamental building blocks of atoms and crystal structure through introduction of Solid State Physics.	Comprehension (Level 2)
CO2.	Knowing the basic concept of x ray diffraction and crystal lattice structure.	Knowledge (Level 1)
CO3.	Using an understanding of electron theory of solids and concept of phonon working of various diodes are known.	Application (Level 3)
CO4.	On applying thermal energy the behaviour of materials is changed that property is utilized in many	Analysis (Level 4)

	equipments	
CO5.	Applying the knowledge of crystal structure, electron theory and thermal properties of materials to various physical experiments.	Evaluation (Level 5)
UPHP42 Core Practical – II		
CO1.	Understanding the spectrometer experiment and finding the angle of prism and deviation of light.	Knowledge (Level 1)
CO2.	Identifying the link between theory and experiment on various experiments like Carey Foster, LCR series and parallel experiments.	Comprehension (Level 2)
CO3.	Using an understanding of Zener diode experiments voltage regulation principles in electrical equipments can be known.	Application (Level 3)
CO4.	Designing experiments and acquire data in order to study about the various working configuration transistor.	Analysis (Level 4)
CO5.	Applying the knowledge of light property, diode and transistor characteristics students are able to correlate theory and experiments and make useful conclusions.	Synthesis (Level 6)
UPHA41 Ancillary Physics Practical		
CO1.	Understanding the experimental ideas related with Properties of matter, optics, electricity and magnetism.	Knowledge (Level 1)
CO2.	Exposing the non physics under graduate students to the technique of handling simple measuring instruments and its physical concepts.	Comprehension (Level 2)
CO3.	Using an understanding of viscosity of liquids by Stoke's Method and Poiseuille's principles the property of liquids can be understood	Application (Level 3)
CO4.	By doing the potentiometer experiments for the calibration of Ammeter and voltmeter the students are able to analyze the error in the instrument and correct it.	Analysis (Level 4)
CO5.	Designing experiments like diodes, logic gates and zener diodes, analyzing observation and make meaningful conclusions.	Evaluation (Level 5)
UPHE42 Solar Thermal & Renewable Energy Systems		
CO1.	Knowledge gaining, regarding conventional and nonconventional energy resources available for conversion to electricity and related technological advancements.	Knowledge (Level 1)
CO2.	Assessing the solar radiation measurement, solar constant, solar radiation geometry and its tilted surface.	Evaluation (Level 5)
CO3.	Using an understanding of solar energy utilization it can be used for water heating power generation for home and agricultural purposes.	Application (Level 3)
CO4.	Designing experiments to trap wind energy using turbines and blades and convert to useful electrical energy.	Analysis (Level 4)
CO5.	Solving problems of bio waste and how to convert them into useful electrical energy.	Synthesis (Level 6)
UPHT41 Biomedical Instrumentation		

CO1.	Knowledge gaining about the biomedical instruments available for usage.	Knowledge (Level 1)
CO2.	Understanding the working principles of Bio potential electrodes, purpose and its types.	Comprehend (Level 2)
CO3.	Understanding of Micro piper, depth and needle electrodes, surface electrodes, elementary mathematics along with physical principles.	Comprehend (Level 2)
CO4.	Designing experiments and acquire data in order to explore physical principles of ECG, EEG, EMG and effectively communicate results, and critically evaluate scientific studies.	Analysis (Level 4)
CO5.	Analyzing the working of Pace Maker- Pace Maker batteries- defibrillators, defibrillators-nerve and muscle stimulators.	Evaluation (Level 5)
UPHN31		Electronics in Daily Life
CO1.	Understanding of basic electronics concepts and its applications in daily life for non physics students.	Comprehension (Level 2)
CO2.	Assessing the contributions of physics to electrical equipments, formulas, fuse wire transistors and IC chips.	Analysis (Level 4)
CO3.	Using an understanding of physical principles and laws associated with electronic home appliances like Radio, Tape recorder, CD,DVD player	Application (Level 3)
CO4.	Analysing the basic principles of Telephone, wireless phone and antenna.	Analysis (Level 4)
CO5.	Safety mechanism in handling electrical appliances, hazards prevention protection and power saving methods.	Synthesis (Level 6)
UPHT51		Electronics
CO1.	Providing the fundamental aspects regarding development of electronics in discrete components	Knowledge (Level 2)
CO2.	Understanding the Transistor characteristics and its parameters, Amplifiers and its applications.	Comprehension (Level 2)
CO3.	Using an understanding of oscillators and amplifiers with its physical principles by doing experiments	Application (Level 3)
CO4.	Designing experiments using integrated chips by constructing adder, subtractor integrator and differentiator..	Analysis (Level 4)
CO5.	Evaluating the function of amplifier, oscillators and adder, subtractor.	Evaluation (Level 5)
UPHT52		Classical and Statistical Mechanics
CO1.	Understanding the concept of D'Alemberts principle and Langrange principle.	Comprehension (Level 2)
CO2.	Acquiring the knowledge about variational principles and two body central force problem.	Knowledge (Level 1)
CO3.	Using an understanding of statistical physics and elementary mathematics along with physical principles	Application (Level 3)
CO4.	Designing experiments and acquire data in order to explore physical principles, phase space, Fermi energy and electron gas in metals.	Analysis (Level 4)
CO5.	Solving problems encountered in classical and statistical Mechanics.	Evaluation (Level 5)
UPHT53		Quantum Physics
CO1.	Understanding the basic concepts of Quantum Mechanics to explain natural physical processes and related	Comprehension (Level 2)

	technological advances.	
CO2.	Acquiring the Knowledge about failure of classical and evolution of quantum physics.	Knowledge (Level 1)
CO3.	Using an understanding of wave mechanical concepts schrodinger's wave mechanical concepts are known	Application (Level 3)
CO4.	Acquiring knowledge about linear vector space, Eigen value and Eigen function and evaluation of related scientific studies.	Evaluation (Level 5)
CO5.	Solving problems encountered in one dimensional and three dimensional problems free particle and square well potential.	Synthesis (Level 6)
UPHT54 Laser Physics		
CO1.	Acquiring the knowledge about basic principles of Lasers and Laser spectroscopy.	Knowledge (Level 1)
CO2.	Learning the characteristics of Laser, coherence and Intensity.	Comprehension (Level 2)
CO3.	Using an understanding of basic physics of laser media together with the system configurations that facilitate a range of desirable options.	Application (Level 3)
CO4.	Applying the knowledge of holography and deep insight into optical fibrecommunication. Designing experiments and acquire data in order to explore physical principles.	Analysis (Level 4)
CO5.	Types and applications of waves, interference, coherence of spectral lines and mono chromaticity	Evaluation (Level 5)
UPHT55 Optics and Spectroscopy		
CO1.	Understanding the fundamentals of optics and related phenomena	Comprehension (Level 2)
CO2.	Acquiring basic knowledge about physical and classical optics.	Knowledge (Level 1)
CO3.	Using an understanding of polarization and Diffraction various experimental facts can be understood	Application (Level 3)
CO4.	Applying Paulis exclusion principle to interpret the electronic configuration of atoms. Illustrate the splitting of spectral lines under the influence of magnetic and electric fields	Analysis (Level 4)
CO5.	Application of light phenomena in infra red spectroscopy and Raman effect.	Synthesis (Level K6)
UPHE53 Medical Physics		
CO1.	Getting information regarding human physiological system, transport of ions through membrane resting and action potential.	Knowledge (Level 1)
CO2.	Understanding Instrumentation for diagnostic X-rays and Instrumentation forthe medical of radio isotopes.	Comprehension (Level 2)
CO3.	Understand the working of various medical instruments. Gain practical knowledge on various instruments.	Application (Level 3)
CO4.	Designing experiments and acquire data in order to Instrumentation for Measuring the mechanics of Breathing – measurements of residual volume.	Analysis (Level 4)
CO5.	Organization of the hospital for patient care monitoring, Aware of the biological effects of radiation, radiation hazards occurring in man, atmosphere and space.	Synthesis (Level 6)
UPHS53 Entertainment Electronics		

CO1.	Acquiring knowledge about various electronics house hold appliances.	Knowledge (Level 1)
CO2.	Assessing the contributions of physics to the development of innumerable electrical devices .	Comprehension (Level 2)
CO3.	Using an understanding of working principle of DVD, Camera, VCD and Computer.	Application (Level 3)
CO4.	Designing experiments and acquire data in order to explore physical principles of I phone, I pad, laptop	Analysis (Level 4)
CO5.	Gathering knowledge about internet, film and video projector.	Evaluation (Level 5)
UPHT61 Digital Electronics		
CO1.	Understanding the various number system and conversion among one another.	Knowledge (Level 1)
CO2.	Applying the basics binary arithmetic and solve the binary problems, logic gates and Boolean Algebra.	Application (Level 3)
CO3.	Using an understanding of combinational and sequential logic system various binary problems can be solved.	Analysis (Level 4)
CO4.	Designing registers and counters using logic circuits and flip flops.	Evaluation (Level 5)
CO5.	Solving binary problems with A/D and D/A convertors	Synthesis (Level 6)
UPHT62 Nuclear Physics		
CO1.	Understanding fundamental concepts of Nuclear physics.	Knowledge (Level 1)
CO2.	Acquiring knowledge about structure, properties of nucleus, isotopes and isobars.	Comprehension (Level 2)
CO3.	Using an understanding of radioactivity principles and carbon dating and neutrino hypothesis	Application (Level 3)
CO4.	Designing experiments cyclotron, GM Counter, cloud chamber and photographic emulsion.	Analysis (Level 4)
CO5.	Understanding the concept of cosmic rays, classification of elementary particles and conservation laws.	Comprehension (Level 2)
UPHT63 Atomic Physics		
CO1.	Understanding the basic concept of atoms and its primitive models.	Comprehension (Level 2)
CO2.	Acquiring knowledge about the powerful phenomena of relativity and wave mechanics.	Knowledge (Level 1)
CO3.	Using an understanding of photoelectric effect photoelectric cell can be constructed.	Application (Level 3)
CO4.	Designing experiments and acquire data in Compton experiment and x – ray diffraction. Bragg’s law and characteristics of X- rays	Analysis (Level 4)
CO5.	Solving problems encountered in everyday life, based on theory of relativity and characteristics of matter waves.	Synthesis (Level 6)
UPHP63 Non- Electronics		
CO1.	By doing spectrometer experiment students are able to understand the properties of light.	Knowledge (Level 1)
CO2.	Using Bridge experiments students are finding the capacitance values and ratio of capacitance.	Comprehension (Level 2)
CO3.	Using an understanding of potentiometer experiment and calibrating ammeter and voltmeter, able to understand correction along with physical principles	Application (Level 3)
CO4.	Understanding magnetometer experiment magnetization and magnetic induction can be found.	Analysis (Level 4)
CO5.	Exposing the students to the technique of handling simple measuring instruments and also makes them	Evaluation (Level 5)

	measure certain mechanical, electrical and optical properties of matter.	
UPHP64		Electronics
CO1.	Understanding the circuit connections of Diodes and Transistors and study of its characteristics.	Knowledge (Level 1)
CO2.	Acquiring hands on knowledge and training of single and multistage amplifiers.	Evaluation (Level 5)
CO3.	Using an understanding of elementary physical principles of oscillators and amplifiers functioning of various electronic devices can be understood.	Application (Level 3)
CO4.	Designing experiments like a stable, mono stable and bi stable multivibrators generation of square wave pulses can be understood.	Analysis (Level 4)
CO5.	Designing of full adder, half adder, half subtractor and full subtractor are studied	Evaluation (Level 5)
UPHE64		Astro Physics
CO1.	Understanding how to unravel the secrets of the universe.	Comprehension (Level 2)
CO2.	Applying basic physical principles from a broad range of topics in physics to astronomical situations.	Application (Level 3)
CO3.	Understanding of the Sun's continuous spectrum and solar interior	Knowledge (Level 1)
CO4.	Acquiring knowledge about Birth of Stars – energy generation and the chemical composition of stars.	Comprehension (Level 2)
CO5.	Getting information about solar eclipse, Galaxies and cosmology.	Knowledge (Level 1)
UPHS64		Microprocessor
CO1.	Understanding the basic concepts of microprocessor, Architecture of 8085 and its applications, solve simple numerical using the concept.	Knowledge (Level 1)
CO2.	Acquiring the knowledge about Architecture of 8085 – Register organization.	Comprehension (Level 2)
CO3.	Using an understanding of Addressing modes of 8085 microprocessor various example programmes can be solved.	Application (Level 3)
CO4.	Data transfer and branch instructions are to be studied	Analysis (Level 4)
CO5.	Solving problems using assembly language and programming simple problems.	Synthesis (Level 6)
M.Sc., PHYSICS		
M.Sc., (Physics) / PPH22 / Programmes Outcomes		
POs	Description of POs	
PO1	Demonstrating an understanding of core knowledge in Physics.	
PO2	Acquiring laboratory skills to take measurements in a Physics laboratory and analyzing the measurements to draw valid conclusions.	
PO3	Analyzing the scientific problems and experiments creatively and critically for research problems	
PO4	Evaluating the basic foundation of the underlying principles and laws of Physics.	
PO5	Demonstrating written and oral communication skills in communicating Physics-related topics.	
PO6	Pursuing higher studies and undertaking research work.	
PO7	Taking up future academic career and establishing themselves in global scenario	

M.Sc., (Physics) / PPH22 / Course Outcomes		
	Course Outcomes	Bloom's Taxonomy / Cognitive Domain
PHY011C Mathematical Physics I		
CO1.	Describing the first order ODEs and their application in physics problems.	Comprehension (Level 2)
CO2.	Evaluating the concept of second and third order ODEs and their meaning.	Evaluation (Level 5)
CO3.	Using Series Solutions of ODEs. Special Functions principles and problems can be solved	Application (Level 3)
CO4.	Analyzing the mathematical concepts and tools such as Beta, Gama functions and partial differential functions to solve numerical problems of physics.	Analysis (Level 4)
CO5	Describing the usefulness of Laplace Transforms in solving problems associated	Synthesis (Level 6)
PHY012C Classical Mechanics		
CO1.	Understanding the concept of D'Alemberts principle and Lagrange principle.	Comprehension (Level 2)
CO2.	Acquiring the knowledge about variation principles and two body central force problem.	Knowledge (Level 1)
CO3.	Using an understanding of statistical physics and elementary mathematics along with physical principles	Application (Level 3)
CO4.	Designing experiments and acquire data in order to explore physical principles, Euler angles, Euler's theorem and Eigen value equation and the principle axis transformation.	Analysis (Level 4)
CO5	Solving problems encountered in classical and statistical Mechanics.	Evaluation (Level 5)
PHY013C Applied Electronics		
CO1.	Deriving the concept of Gibb's duhem rule, Nernst equation, laws of thermodynamics	Creation (Level 6)
CO2.	Understanding the concept of distribution and chemical kinetics, uses of Hammet equation.	Understanding (Level 2)
CO3.	Using an understanding of oscillators and amplifiers with its physical principles by doing experiments	Evaluation (Level 5)
CO4.	Designing experiments using integrated chips by constructing of. D/A and A/D converters.	Analysis (Level 4)
CO5	Evaluating the function of amplifier, oscillators and counters, registers.	Application (Level 3)
PHY014C Practical I		
CO1.	Understanding the OP-amp experiment.	Knowledge (Level 1)
CO2.	Identifying the link between theory and experiment on various experiments like Phase – Shift Oscillator, wein bridge, Square wave generator experiments.	Comprehension (Level 2)
CO3.	Using an understanding of Timer IC NE 555 400and7413experiments voltage regulation principles in electrical equipment's can be known.	Application (Level 3)
CO4.	Designing experiments and acquire data in order to study about the various working configuration of OP-Amp. AndICs.	Analysis (Level 4)
CO5	Applying the knowledge of OP-Amp IC NE 555 7400and7413and students are able to correlate theory and experiments and make useful conclusions.	Synthesis (Level 6)

PHY015E		Numerical Methods
CO1.	Describing Curve fitting problems..	Comprehension (Level 2)
CO2.	Evaluating the concept of Algebraic and Transcendental theorem, formulas and their meaning.	Evaluation (Level 5)
CO3.	Using Simultaneous Equations and problems can be solved	Application (Level 3)
CO4.	Analyzing Newton's Interpolation Formula to solve numerical problems of physics.	Analysis (Level 4)
CO5	Describing the usefulness of Laplace Transforms in solving problems associated	Synthesis (Level 6)
PHY021C		Mathematical Physics II
CO1.	Describing the Fourier Series, Integrals, and Transforms and their application in problems and theory's..	Comprehension (Level 2)
CO2.	Evaluating the concept of Partial Differential Equations (PDEs) and their functions	Evaluation (Level 5)
CO3.	Using Complex Numbers. Complex Plane and Special Functions principles and problems can be solved	Application (Level 3)
CO4.	Analyzing the mathematical concepts and tools such as Line Integral in the Complex Plane - Cauchy's Integral Theorem to solve problems of physics.	Analysis (Level 4)
CO5	Using various models for determining stereo selectivity of various organic transformation	Synthesis (Level 6)
PHY022C		Quantum Mechanics-I
CO1.	Understanding the basic concepts of Quantum Mechanics to explain natural physical processes and related technological advances.	Comprehension (Level 2)
CO2.	Acquiring the Knowledge about General Formalism of Quantum Mechanics of quantum physics.	Knowledge (Level 1)
CO3.	Using the One Dimensional Problems concepts , Alpha Emission, Bloch Waves in a Periodic Potential concepts are known	Application (Level 3)
CO4.	Acquiring knowledge about Two Interacting Particles, Three Dimensional Square-Well Potential, Deuteron. And evaluation of related scientific studies.	Evaluation (Level 5)
CO5	Solving problems encountered in angular momentum and eigen values, eigen function problems free particle and square well potential.	Synthesis (Level 6)
PHY023C		Statistical Mechanics and Thermodynamics
CO1.	Understanding the concept Phase Space, Concept of ensembles and Canonical ensembles.	Comprehension (Level 2)
CO2.	Acquiring the knowledge about Maxwell's distribution of velocities and Problems	Knowledge (Level 1)
CO3.	Using an understanding of Bose-Einstein and Fermi-Dirac Statistics along with Black Body radiation, Photons.	Application (Level 3)
CO4.	Designing experiments Mean free path, Viscosity of gases and the principle axis transformation.	Analysis (Level 4)
CO5	Solving problems Kubo relations fluctuations dissipation theorem. Derivation of the Onsager relations.	Evaluation (Level 5)
PHY024C		Practical II
CO1.	Understanding the General physics experiments	Knowledge (Level 1)
CO2.	Identifying the link between theory and experiment on various experiments like Solar Spectrum, Laser	Comprehension (Level 2)

	Experiments., Zeeman effect, .Band Gap of Thermistor experiments.	
CO3.	Using an understanding of Band Gap of Thermistor, Determination of Solar Constant, Michelson Interferometer, Wavelength and separation of wavelengths equipment's can be known..	Application (Level 3)
CO4.	Designing experiments Hall Effect and Spectral analysis of a salt.	Analysis (Level 4)
CO5	Applying the knowledge Ultrasonic and B-H curve and correlating theory and experiments and make useful conclusions.	Synthesis (Level 6)
PHY025E Materials Characterization		
CO1.	Understanding the concept thermo gravimetric analysis and differentiate thermalanalysis-basic techniques.	Comprehension (Level 2)
CO2.	Acquiring the knowledge about X-Ray Analysis and Optical Methods	Knowledge (Level 1)
CO3.	Using an understanding of Principles of SEM, TEM, EDAX, AFM, EPMA and its instrumentation.	Application (Level 3)
CO4.	Designing the experiments Electrical Methods Hall effect, Carrier density, resistively and two probe and four probe methods.	Analysis (Level 4)
CO5	Solving the solution methods of finding Magnetic and Mechanical properties	Evaluation (Level 5)
PHY031C Electro-magnetic Theory		
CO1.	Understanding the concept of electrostatics and electrical susceptibility	Comprehension (Level 2)
CO2.	Learning the knowledge about Magneto statics, Bound Currents Auxiliary field H-Ampere's law	Knowledge (Level 1)
CO3.	Using an understanding Maxwell Equations and its Boundary conditions.	Application (Level 3)
CO4.	Designing the experiments EM waves and Propagation of EM waves between parallel and perfectly conducting planes	Analysis (Level 4)
CO5	Types of Electromagnetic Radiation waves condition through electric field waves.	Evaluation (Level 5)
PHY032C Quantum Mechanics-II		
CO1.	Understanding the Time Independent Perturbation Theory and its derivations	Comprehension (Level2)
CO2.	Acquiring the Knowledge about General Formalism of Variation Method for Excited States in hydrogen atoms	Knowledge (Level 1)
CO3.	Using the WKB Approximation to solve the Bound States in a Potential Well.	Application (Level 3)
CO4.	Learning the knowledge about Time Dependent Perturbation Theory and its formulas	Evaluation (Level 5)
CO5	Solving the Scattering function equation using scattering theory and Laboratory and Centre of Mass Coordinate Systems.	Synthesis (Level 6)
PHY033C Solid State Physics		
CO1.	Understanding of the basics of fundamental building blocks of atomsandcrystal structure through the concept of a lattice values	Comprehension (Level 2)
CO2.	Knowing the Vibrations of linear mono-atomic and diatomic chains. And lattice dynamics	Knowledge (Level 1)
CO3.	Using an understanding of Free electron theoryof solids and concept of Kronig-Penny model, Bloch	Application (Level 3)

	Theorem. Approximate solution near a zone boundary	
CO4.	On applying Occurrence of super conductivity, Destruction of superconductivity by magnetic fields	Analysis (Level 4)
CO5	Applying the knowledge of crystal structure, electron theory and thermal properties of materials to Ferro magnetic materials	Creation (Level 6)
PHY034C Practical III		
CO1.	Understanding the. Ascending and descending order of numbers and characters Matrix addition, subtraction and multiplication, Transpose of a matrix programmes	Knowledge (Level 1)
CO2.	Acquiring hands on knowledge and training of straight line fit using the method of least squares for a table of data points and polynomial curve fitting	Evaluation (Level 5)
CO3.	Using an understanding of tabulated data using trapezoidal rule, Simpson's rule and the solution of a first order differential equation of type $y'=f(x,y)$ using the fourth order Runge-Kutta method can be understood.	Application (Level 3)
CO4.	Designing the programme interpolation value at a specified point, given a set of data points using Newton's interpolation representation and calculate and print the mean, variance and standard deviation of set of N numbers.	Analysis (Level 4)
CO5	Designing of to read a set of numbers, count them and find and print the largest and smallest numbers in the list and their positions in the list are studied	Evaluation(Level 5)
PCST33 Material Science		
CO1.	Understanding the Nanomaterial and its application	Comprehension (Level 2)
CO2.	Applying the polymers characteristics for preparation of types of polymers.	Application (Level 3)
CO3.	Understanding of the Dielectrics materials and Electrical polarization, Mechanisms of polarization	Knowledge (Level 1)
CO4.	Acquiring knowledge about Purification of electronic materials and crystal growth.	Comprehension (Level 2)
CO5	Getting information about Classification of magnetism Concept of soft and hard magnetic domain structure	Knowledge (Level 1)
PHY041C Spectroscopy		
CO1.	Knowledge gaining, and regarding of Infrared spectroscopy, IR spectrophotometer-Instrumentation	Analysis (Level 4)
CO2.	Assessing the Theory of Raman scattering for stocks line and anti-stocks line	Analysis (Level 4)
CO3.	Using an understanding of Electronic spectroscopy for vibrational electronic spectra functions	Application (Level 3)
CO4.	Designing NMR and ESR experiments Techniques for theory instrumentation applications	Evaluation (Level 5)
CO5	Solving the Chemical bonding-Halogen quadrupole resonance. Moment usingEQR technique	Creation (Level 6)
PHY042C Nuclear Physics and Particle Physics		
CO1.	Understanding the concepts of General Properties of nuclei	Knowledge (Level 1)
CO2.	Acquiring knowledge about structure, properties of nucleus, isotopes and isobars for nuclear models	Comprehension (Level 2)

CO3.	Using an understanding of Experimental Techniques for Detectors and chambers.	Application (Level 3)
CO4.	Designing experiments for types of Nuclear reactions	Analysis (Level 4)
CO5	Understanding the concept of cosmic rays, classification of elementary particles and conservation laws.	Comprehension (Level 2)
M.Phil., PHYSICS		
M.Phil., (Physics) / MPH22 / Programmes Outcomes		
POs	Description of POs	
PO1	Gaining a broad knowledge of the physical principles of the universe	
PO2	Comprehending the fundamental laws for the study of various areas of physics and defines and describes them with clarity.	
PO3	Knowing the application of principles and concepts of Physics with necessary practical background and assess their consequences.	
PO4	Discussing, formulating and analyzing the problems and identifying the key concepts and principles to solve them.	
PO5	Evaluating the basic foundation of the underlying principles and laws of Physics	
PO6	Developing critical thinking and quantitative reasoning skills,	
PO7	Analyzing the scientific problems and experiments creatively and critically	
M.Phil., (Physics) / MPH22 / Course Outcomes		
	Course Outcomes	Bloom's Taxonomy / Cognitive Domain
MPST11		Research Methodology
CO1.	Knowing the research methods and techniques, selecting and formulating research problems	Knowledge (Level 1)
CO2.	Collecting literature based on research problem and understanding the concepts	Comprehension (Level 2)
CO3.	Using an understanding of mathematical concepts for solving problems with physical principles	Analysis (Level 4)
CO4.	Designing experiments and acquire data in order to explore physical principles, effectively communicate results, and critically evaluate related scientific studies..	Evaluation (Level 5)
CO5	Producing results based on scientific problems encountered in everyday life.	Synthesis (Level 6)
MPST12		Advanced Experimental Techniques
CO1.	Acquiring the knowledge about various techniques available for characterising the materials	Knowledge (Level K1)
CO2.	Assessing the structure of various materials synthesized using X-ray diffraction experiments.	Comprehension (Level 2)
CO3.	Understanding of light property of materials from UV Visible spectroscopy	Application and Analysis (Level K3 and Level K4)
CO4.	Designing experiments for the structural analysis of samples IR and Raman Spectroscopy are used.	Synthesis (Level 6)
CO5	Analysing Morphology and Strength of materials using SEM and TEM experimental setup .	Analysis (Level 4)
MPST13		Professional Skills
CO1.	Acquiring knowledge of communication skills with special reference to its elements, types, development and styles.	Knowledge (Level 1)

CO2.	Understanding the terms like Communication technology, Computer Mediated Teaching	Comprehension (Level 2)
CO3.	Developing skills in ICT and applying them in teaching, learning contexts and research.	Synthesis (Level 6)
CO4.	Developing Multimedia/E-contents in their respective subjects.	Synthesis (Level 6)
CO5	Integrating Technology into Teaching and Learning	Synthesis (Level 6)