



A.D.M. COLLEGE FOR WOMEN

(Autonomous)

Affiliated to Bharathidasan University

(Nationally Accredited with "A" Grade by NAAC – 3rd Cycle)

NAGAPATTINAM 611 001.

PG DEPARTMENT OF PHYSICS

PROGRAMME – B.Sc. PHYSICS

PO NO.	PROGRAMME OUTCOMES Upon completion of the B.Sc. Degree Programme, the graduate will be able to
PO – 1	procedural knowledge that creates different types of professionals related to the disciplinary/subject area of Physics, including professionals engaged in research and development, teaching and government/public service; skills in areas related to one's specialization area within the disciplinary/subject area of Physics and current and emerging developments in the field of Physics.
PO – 2	Demonstrate the ability to use skills in Physics and its related areas of technology for formulating and tackling Physics-related problems and identifying and applying appropriate physical principles and methodologies to solve a wide range of problems associated with Physics.
PO – 3	Recognize the importance of mathematical modeling simulation and computing, and the role of approximation and mathematical approaches to describing the physical world.
PO – 4	Plan and execute Physics-related experiments or investigations, analyze and interpret data/information collected using appropriate methods, including the use of appropriate software such as programming languages and purpose-written packages, and report accurately the findings of the experiment/investigations while relating the conclusions/findings to relevant theories of Physics. promoting safe learning and working environment

PSO NO.	PROGRAMME SPECIFIC OUTCOMES Upon completion of these courses the student would
PSO – 1	Enhancing conceptual knowledge
PSO – 2	Awareness on impact of physics.
PSO – 3	Observational, measuring and computational techniques.
PSO – 4	Imparting experimental skills.
PSO – 5	Problem analyzing, logical thinking, reasoning, troubleshooting and solving skill

Course Title	CORE COURSE-I PROPERTIES OF MATTER AND ACOUSTICS		
Code	PUA		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	To learn how to measure elasticity by various methods	PSO3,4	U, AN
CO-2	To demonstrate a basic understanding of bending of beams, depression and Elevation of Cantilever.	PSO3,4	U, AP
CO-3	Define surface tension as a physical Property and the units that are used to measure it.	PSO3,4	U, AN
CO-4	Learn about the formula for viscosity, fluid flow and measurement of viscosity using lab experiments.	PSO3,4	U, AP
CO-5	Experience when our ears are excited by vibration in the gas that surrounds us and production, detection and medical applications of Ultrasonic waves.	PSO1,2	U, AP

Course Title	CORE COURSE-III MECHANICS		
Code	PUC		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand laws of motion and their application	PSO 2	AP
CO-2	Learn the concept of conservation of energy, momentum, Angular momentum	PSO1	U
CO-3	Understand the analogy between translational and rotational dynamics, and application of both motions simultaneously in analyzing rolling with slipping.	PSO2	U
CO-4	Develop the Energy of the Friction with the compound Pendulum and friction clutch.	PSO3,4	AN
CO-5	To understand various Dynamical Situations, Notion of Inertial Frames and Concept of Galilean Invariance.	PSO1,2	U, AP

Course Title	CORE COURSE-IV THERMAL PHYSICS		
Code	PUD		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Students will demonstrate a basic understanding of the concepts and underlying principles of classical physics.	PSO 2,3	U, AP
CO-2	Students will gain an appreciation of the quantitative methods used in Physics	PSO 2,3	U, AP
CO-3	Understand the concept of thermodynamics and there laws.	PSO 2	U
CO-4	Understand the Heat Engine and there uses.	PSO 4	AC
CO-5	Describe the thermodynamic function and there relations	PSO 1	R

Course Title	NON-MAJOR ELECTIVE I ENERGY PHYSICS		
Code	PUEI		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the sources of energy and their contributions to the energy and power needs of the nation and the world.	PSO 3	U
CO-2	Be able to effectively use Rankine Cycle analysis	PSO2	AP
CO-3	Understand the differences between large quantities of fuel and waste	PSO 1	AC
CO-4	Fully appreciate the aspect of capital cost amortization and allocation to unit of energy produced.	PSO 4	AP
CO-5	Be able to analyze comparisons of capital cost allocation, operating cost, including fuel costs. Special attention is given to the renewables for which there is zero or negligible fuel cost.	PSO 3	AC

Course Title	NON-MAJOR ELECTIVE I COMPETITIVE EXAMINATIONS		
Code	PUEI		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Deeper knowledge of subjects	PSO 3	U
CO-2	It motivates the students to prepare for high level competitive exams	PSO2	AP
CO-3	Competitive exams will enhance the skill of understanding the application of concepts, which is required in a broader context when we appear for higher level exams	PSO 1	AC
CO-4	Early exposure to learning and competition builds confidence and sharpens skills which raise ones level from other students on the same platform.	PSO 4	AP
CO-5	It boosts morale while moving ahead in the future	PSO 3	AC

Course Title	CORE COURSE -VI ELECTRICITY, MAGNETISM AND ELECTROMAGNETISM		
Code	PUF		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	After the completion of the course, Students will be able to	PSO2	R
CO-2	Explain various phenomenon like Ferromagnetism, ant ferromagnetism etc.	PSO3,4	U, AP
CO-3	Understand the relation in between Electromagnetic theory.	PSO1, 2	AP
CO-4	Explain various phenomenon in light of maxwell equations.	PSO 4	AP
CO-5	Familiarise with Ac Circuits.	PSO 2,3	AP

Course Title	SKILL BASED ELECTIVE I ASTROPHYSICS		
Code	PUS1		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Become familiar with nuclear particles and different particle accelerators. Student is expected to know the working of different accelerators.	PSO1	U, AP
CO-2	Have Peripheral ideas about astronomy and astrophysics	PSO 1	AP
CO-3	Student describe all of the major structures of the Solar System.	PSO 3	AC
CO-4	Student can describe the history of the Solar System.	PSO 1	AC
CO-5	Atmospheres of objects in the solar system.	PSO 5	AN

Course Title	SKILL BASED ELECTIVE I SPACE SCIENCE		
Code	PUS1		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Demonstrate knowledge and understanding of the structure and function of earth systems and the major interactions among them.	PSO1	U, AP
CO-2	Outline the formation of the Earth and the solar system and explain the process of the earth's evolution, with emphasis on geologic time, plate tectonics, weathering and erosion, freshwater systems, oceans, climate and climate change.	PSO 1	AP
CO-3	Demonstrate understanding of the origin and evolution of the universe as well as the birth and death of stars.	PSO 3	AC
CO-4	Discuss the human impact on geological resources and the sustainable use of mineral resources.	PSO 1	AC
CO-5	Discuss the importance of recent developments and applications in earth and planetary science.	PSO 5	AN

Course Title	Semester-IV / Non-Major Elective II WEATHER FORECASTING		
Code	PUE2		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Students can demonstrate knowledge of the typical vertical variation of the basic variables used to quantify the atmospheric state, including temperature, pressure, humidity, winds, and natural and anthropogenic particles	PSO1	U
CO-2	Students can demonstrate knowledge of the basic techniques used by meteorologists (and other scientists) to gather and interpret atmospheric data	PSO 4	AC
CO-3	Students can demonstrate knowledge of climate and climate change, together with the possible influences that humans have on diverse climate phenomena	PSO4	AC
CO-4	Students can demonstrate knowledge of the forces that drive	PSO3	AC
CO-5	Students can demonstrate knowledge of clouds and their formation mechanisms, together with the precipitation types and other materials that precipitation cleanses from the air	PSO2	AP

Course Title	NON-MAJOR ELECTIVE II REMOTE SENSING AND GIS		
Code	PUE2		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the concepts of Photogrametry and compute the heights of objects	PSO1	U
CO-2	Understand the principles of aerial and satellite remote sensing, Able to comprehend the energy interactions with earth surface features, spectral properties of water bodies .	PSO 4	A C
CO-3	Understand the basic concept of GIS and its applications, know different types of data representation in GIS	PSO4	A C
CO-4	Understand and Develop models for GIS spatial Analysis and will be able to know what the questions that GIS can answer	PSO3	A C
CO-5	Apply knowledge of GIS software and able to work with GIS software in various application fields	PSO2	AP

Course Title	CORE COURSE VII OPTICS		
Code	PUG		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the physics behind various phenomenon in wave and optics.	PSO 1	U
CO-2	Understand various phenomenon and the cause or origin of them.	PSO 3	AP
CO-3	Explain the relationship in between various optical phenomenons with the Fourier series and matrix.	PSO 3,4	U, AP
CO-4	Understand various natural phenomenons which is happening in their surroundings.	PSO 3	C
CO-5	Explain the relationship in between various optical phenomenons.	PSO 2	U, AP

Course Title	CORE COURSE VIII ATOMIC AND MOLECULAR PHYSICS		
Code	PUH		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	To analyze various types of spectrography to study about the positive rays.	PSO 2,4	U
CO-2	Explain magneto optical properties of materials.	PSO 1,2	U
CO-3	To find applications of photo electrical cells and x-rays.	PSO 2,4	U, R
CO-4	They should be able to calculate the effect of an electrical field on the energy levels of the hydrogen atom.	PSO 1,2	U
CO-5	Students learn about electronic, rotational and vibrational energy levels of diatomic molecules.	PSO 2	U

Course Title	CORE COURSE IX ELECTRONIC		
Code	PUI		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO -1	Explain the theoretical principles essential for understanding the operation of electronic circuit	PSO 3, 4	AP
CO -2	Measure the characteristics of electronic circuit and present experiment result	PSO 3	AP
CO -3	Analyze electrical circuit and calculate the main parameters	PSO 3	AN
CO -4	Develop Design and create simple analogue and digital electronics circuit	PSO 3, 4	AN, AP
CO-5	Understand the fundamentals and area of application for the integrated circuit	PSO 3, 4	AP

Course Title	SKILL BASED ELECTIVE –II BIOMEDICAL INSTRUMENTATION		
Code	PUS2		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Study the function of bioelectric potentials and its importance and understand the different types of waveforms generated by organs.	PSO 1	U
CO-2	Learn the fundamental knowledge of the electrodes to sense bio potentials.	PSO 1, 2	U
CO-3	Learn the basic concepts and interpretations of ECG and BP.	PSO 1, 2	U
CO-4	Understand the anatomy of the nervous system and its signal measurements (EMG, CAT).	PSO 1	AC
CO-5	Analyze and understand the applications of the imaging techniques transmission(x- ray and ultrasound)	PSO 2, 4	U

Course Title	MAJOR BASED ELECTIVE I MICROPROCESSOR AND “C” PROGRAMMING		
Code	PUE3		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Write programs to run on 8085 microprocessor	PSO 1, 2	U
CO-2	Understand and device techniques for faster execution of instruction, improve speed of operations.	PSO 2, 4	AP
CO-3	Understand microprocessor and its advantage.	PSO 3	AP
CO-4	Describe the fundamental components of a C program, e.g source file, header file, mainfunction, functions and librarie.	PSO 2	U
CO-5	Explain and apply fundamental syntax rules for identifies, declarations, expressions, statements and functions.	PSO 3, 4	U, AP

Course Title	MAJOR BASED ELECTIVE I Principles Of Information Technology		
Code	PUE3		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Applying the Basic Concepts in Information Technology	PSO 1, 2	U
CO-2	Understand Software and Operating system of programming language.	PSO 2, 4	AP
CO-3	Using the fundamental of Data base management System in database design.	PSO 3	AP
CO-4	Design the basic Network.	PSO 2	U
CO-5	Practice the application of Technology.	PSO 3, 4	U, AP

Course Title	SKILL BASED COURSE -III STATISTICS		
Code	PUS3		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Organize, manage and present data.	PSO 5	U
CO-2	Analyse statistical data using measures of central tendency dispersion and location	PSO 5	AN
CO-3	Analyse statistical data graphically using frequency distribution and cumulative frequency distribution.	PSO 5	AN
CO-4	Use discrete and continuous probability distributions, including mean, median, mode	PSO 5	AN
CO-5	Identify the type of characteristics of different discrete and continuous distributions.	PSO 5	AP

Course Title	CORE COURSE-XI NUCLEAR PHYSICS		
Code	PUK		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain nuclear properties compare crop of liquid with that of a nucleus and understand shell model.	PSO 2	U
CO-2	Distinguish between principles and working of different types of detectors, counters and accelerators.	PSO 1	AC
CO-3	Describe basic radioactivity calculate half-live and understand radiation hazards.	PSO 2	U
CO-4	Explain natural and artificial transmutations, calculate Q-value of a reaction, recognize the applications of isotope	PSO 2	U
CO-5	Explain nuclear properties compare crop of liquid with that of a nucleus and understand shell model.	PSO 2	U

Course Title	CORE COURSE XII CLASSICAL AND QUANTUM PHYSICS		
Code	PUL		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	After taking this course students will be able to appreciate the beauty of quantum mechanics. They will be knowing all types of representations of operators and ways to apply them in different problems.	PSO 1	AC
CO-2	The most important thing students learned from this course was how to solve the hydrogen atom problem by using quantum mechanics.	PSO 1	AC
CO-3	Describe and understand the motion of a mechanical system using Lagrange Hamilton formalism.	PSO 1	U
CO-4	Describe and understand the motion of the forces in non inertial systems	PSO 1	AC
CO-5	Understand and explain the differences between classical and quantum mechanics.	PSO 1	U

Course Title	MAJOR BASED ELECTIVE II MATERIALS SCIENCE		
Code	PUE4		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Upon completion of this course the student will be able to:	PSO 1	AP
CO-2	Identify the properties of metals with respect to crystal structure and grain size	PSO 1	AC
CO-3	Interpret the phase diagrams of materials	PSO 1	AP
CO-4	Classify and Distinguish different types of cast irons, steels and non ferrous alloys.	PSO 2	U, AC
CO-5	Describe the concept of heat treatment of steels & strengthening mechanisms	PSO 1	AP

Course Title	MAJOR BASED ELECTIVE III COMMUNICATION PHYSICS		
Code	PUE5		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Students will demonstrate an understanding of core knowledge in physics, including the major premises of classical mechanics, E&M and Modern Physics.	PSO 1	R
CO-2	Students will demonstrate written and oral communication skills in communicating physics-related topics.	PSO 4	AP
CO-3	Students will demonstrate understanding of the applications of numerical techniques for modeling physical systems for which analytical methods are inappropriate or of limited utility.	PSO 5	AN
CO-4	Students will demonstrate a thorough understanding of the analytical approach to modeling of physical phenomena.	PSO 5	AP
CO-5	Students will demonstrate an understanding of the impact of physics and science on society.	PSO 2	C



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PG DEPARTMENT OF PHYSICS

PROGRAMME – M.Sc. Physics

PO NO.	PROGRAMME OUTCOMES Upon completion of the M.Sc. Degree programme, the graduate will be able to
PO – 1	Students must be able to take important managerial decisions. Demonstrate relevant generic skills and global competencies at National and Global level.
PO – 2	Students would have acquired thorough knowledge in the field of problem-solving skills that are required to solve different types of Physics-related problems with well-defined solutions, and tackle open-ended problems that belong to the disciplinary area.
PO – 3	Investigative skills, including skills of independent investigation of Physics-related issues and problems in Research areas.
PO – 4	Communication skills involving the ability to listen carefully, to read texts and research.
PO – 5	Papers analytically and to present complex information in a concise manner to different research field and teaching profession.

PSO NO.	PROGRAMME SPECIFIC OUTCOMES Upon completion of these courses the student would
PSO – 1	Research – Acquire recent knowledge towards research
PSO – 2	Entrepreneurship and Employability
PSO – 3	Exploring problem solving
PSO – 4	Adopt new technology
PSO – 5	Projects and model design

Course Title	Semester-I/ CORE COURSE IMATHEMATICAL PHYSICS		
Code	PGPA		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	To learn various mathematical concepts and techniques in vector space, groups and functions of special types to solve physical problems.	PSO 1	AC
CO-2	Revise the knowledge of calculus, vectors, vector calculus, probability and probability distributions.	PSO 1	AC
CO-3	Learn the basic properties of gamma, beta function and differential equation	PSO 3	U, AN
CO-4	Describe the basic ideas about cauchy's integral theorem and integral formulation	PSO 3	U, R
CO-5	Quantitative understanding of group theory, classes, cosets sub groups.	PSO 3	U, AP

Course Title	Semester-I / Core Course-II CLASSICAL DYNAMICS AND RELATIVITY		
Code	PGPB		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Have a deep understanding of Newton law.	PSO 1	U, R
CO-2	Apply to variation principle to real physical problems.	PSO3	AN, AP
CO-3	Able to frame model in mechanical systems, both in inertial and rotating frames and Hamilton equation.	PSO3	U
CO-4	Identify the forces and torques occurring in a given problem.	PSO3	U, AP
CO-5	To setup the equation of motion and solve the problems.	PSO4	AP

Cours eTitle	Semester-I / CORE COURSE III ELECTRONICS		
Code	PGPC		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain the theoretical principles essential for understanding the operation of electronic circuit.	PSO 1	U, AP
CO-2	Analyze electrical circuit and calculate the main parameters.	PSO1	U
CO-3	Develop Design and create simple analogue and digital electronics circuit.	PSO4	U, AP
CO-4	Understand the fundamentals and area of application for the integrated circuit.	PSO1	U,AP
CO-5	Know about the multistage amplifier using BJT and FET various configuration	PSO4	AC, AP

Course Title	Semester-I / CORE COURSE IV METHOD OF SPECTROSCOPY		
Code	PGPD		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Explain what it means to use Spectroscopic methods for qualitative and quantitative analysis.	PSO1	U, R
CO-2	Compare and contrast of atomic and molecular spectra.	PSO1	AN
CO-3	Explain the difference between stokes and anti-stokes line in a Raman spectrum.	PSO1	AC
CO-4	Understanding of Quantum theory and NMR spectroscopy.	PSO5	U
CO-5	The probability of transition between vibration levels of two electronic states determined by Frank-Condon principle.	PSO1	U

Course Title	Semester-I/ CORE COURSE V ELECTRO MAGNETIC THEORY		
Code	PGPF		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	The theory of electromagnetic propagation of electromagnetic fields.	PSO1	U, R
CO-2	Learn the boundary value problem in electrostatics methods of image charges.	PSO3	U, AN
CO-3	Understand Maxwell equation and its physical significance.	PSO1	U
CO-4	Learn Electromagnetic waves and wave propagation.	PSO1	U
CO-5	Understand magneto static and magnetic dipole.	PSO1	AC

Course Title	Semester-II / CORE COURSE VI QUANTUM MECHANICS		
Code	PGPG		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Solves the time-independent Scrodinger equation as an solve intermediate step to solve the time dependent Scrodinger equation.	PSO3	U
CO-2	Identifies correctly the mathematical space that contains all possible states of a physical system, using Dirac 's equation.	PSO1	AN
CO-3	Build a Hilbert space based on a complete set commuting observables.	PSO1	AN,AC
CO-4	Relativistic Quantum mechanics understanding the Klein Gordon equation for a free particle and Dirac equation for a free particle and Dirac matrices.	PSO4	AN, AC
CO-5	Compute the energy levels and evaluation the quantum simple harmonic oscillator.	PSO1	U

Course Title	Semester-II/ ELECTIVE COURSE I MICROPROCESSOR AND MICROCONTROLLER		
Code	PGPE1		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO -1	Write programs to run on 8085 microprocessor.	PSO3	AP
CO -2	Understand and device techniques for faster execution of instruction, improve speed of operations.	PSO1	U, AP
CO -3	Understand microprocessor and its advantage.	PSO1	U
CO -4	Describe the fundamental components of a C program e.g source file, header file, main function , functions and libraries.	PSO4	U
CO-5	Explain and apply fundamental syntax rules for identifies , declarations, expressions, statements and functions.	PSO1	AN, AC

Course Title	Semester-II/ ELECTIVE COURSE I DATA COMMUNICATION AND COMPUTER NETWORKS		
Code	PGPE1		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO -1	Understand importance of data communication systems and fundamentals.	PSO3	AP
CO -2	Distinguish and relate various physical Medias, interfacing standards and adapters.	PSO1	U, AP
CO -3	Explain various flow control techniques.	PSO1	U
CO -4	Analyze short range and long range wireless technologies	PSO4	U
CO-5	Analyze various modulation technique in analog and digital Carrey system	PSO1	AN, AC

Course Title	Semester-II / ELECTIVE COURSE II NUMERICAL METHODS AND C++ PROGRAMMING		
Code	PGPE2		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	To Equip them with sufficient Knowledge base of physics so that they do not find any difficulty pursuing higher Education	PSO 1	U, R
CO-2	Trained practical exposure which could equip to face the challenges in Physics.	PSO3	AN, AP
CO-3	Understanding the Programming in C++ in constants and variables of the functions	PSO1	U, AC
CO-4	To Write C++ computer programming necessary for numerical integration to trapezoidal and simpson 's 1/3 rule	PSO3	AP
CO-5	Understand the various statements and Arrays.	PSO3	AP

Course Title	Semester-II / ELECTIVE COURSE II COMPUTER ORGANIZATION		
Code	PGPE2		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Recognize and explain the functional units of computers	PSO 1	U, R
CO-2	Describe assembly languages and machine instructions by analyzing how the data is stored and fetched from memory.	PSO3	AN, AP
CO-3	Explain the execution of complete instruction and bus organizations.	PSO1	U, AC
CO-4	Identify various interrupt handling mechanism and buses.	PSO3	AP
CO-5	Differentiate between different types of memories.	PSO3	AP

Course Title	Semester-III / CORE COURSE VII STATISTICAL MECHANICS		
Code	PGPI		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	They easily to determine the probability of any type of an event.	PSO1	U, R
CO-2	Students have understood the concept of phase space and its volume.	PSO1	U
CO-3	They can easily distinguish between different types of particles and statistics.	PSO1	AC
CO-4	They can easily distribute bosons and fermions and classical particles among energy levels.	PSO1	U, AN
CO-5	After studying Fermi Dirac Statistics, students have learnt to deal with many electron systems in real life.	PSO4	AC

Course Title	Semester-III/ CORE COURSE VIII SOLID STATE PHYSICS		
Code	PGPJ		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Students will develop range of communication and teaching skills.	PSO1	U
CO-2	How diffraction of electromagnetic waves on solid matter can be used to obtain lattice structure.	PSO1	U,R
CO-3	Know the concept of phonons, and how the dispersion relationship appears for different lattice structures.	PSO1	AC, AP
CO-4	Explain how a lattice vibrates at finite temperature, and how these vibrations determine the heat capacity and conduction.	PSO1	U, R
CO-5	Apply models to describe defects and diffusion.	PSO4	AC

Course Title	Semester-III / ELECTIVE COURSE-III NANO MATERIALS AND APPLICATIONS		
Code	PGPE5		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the synthesis of nanomaterials and their application and the impact of nanomaterials on environment	PSO1	U
CO-2	Apply their learned knowledge to develop Nanomaterial's.	PSO1	U,AC
CO-3	Choose appropriate synthesis technique to synthesize quantum nanostructures of desired size, shape and surface properties.	PSO4	AC, AN
CO-4	Appreciate enhanced sensitivity of nanomaterial based materials and their novel applications in industry.	PSO1	AC, AN
CO-5	Understand the synthesis of nanomaterials and their application and the impact of nanomaterials on environment	PSO4	U, AC

Course Title	Semester-III / ELECTIVE COURSE-III CRYSTAL PHYSICS		
Code	PGPE5		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Students will learn about the fundamentals of Crystal Growth	PSO1	U
CO-2	To learn about Nucleation mechanism and different kinds of nucleation.	PSO1	U,AC
CO-3	To learn about important crystal growth technique like Bridgeman, czochralski (pulling method), solution growth and hydrothermal methods, physical and chemical vapor transport.	PSO4	AC, AN
CO-4	To understand with various techniques involved in crystal growth.	PSO1	AC, AN
CO-5	To determine various theoretical parameters.	PSO4	U, AC

Course Title	Semester-III / ELECTIVE COURSE-IV COMMUNICATION PHYSICS		
Code	PGPE4		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Demonstrate critical and innovative thinking	PSO-2, 4	U
CO-2	Display competence in oral, written and visual communication.	PSO-2	U
CO-3	Show an understanding of opportunities in the field of communication.	PSO-4	U
CO-4	Students will demonstrate an understanding of the impact of physics and science on society	PSO-2	R
CO-5	Identify the applications in communications.		

Course Title	Semester-III / ELECTIVE COURSE-IV LASER AND FIBER OPTICS		
Code	PGPE4		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the principle and structure of optical fibers.	PSO-2, 4	U
CO-2	Understand the working principle of fiber optical sources and couplers and apply it in the optical communication systems.	PSO-2	U
CO-3	Apply the fundamental principles of optics and light wave to design optical fiber communication systems.	PSO-4	U
CO-4	Understand different analog and digital transmission systems.	PSO-2	R
CO-5	Understand and apply the concepts of coherent optical modulation and detection techniques.		

Course Title	Semester-IV/ CORE COURSE IX NUCLEAR AND PARTICLE PHYSICS		
Code	PGPL		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Determine nuclear properties such as binding energy, spin and parity in the framework of the liquid drop model and the shell model of the nucleus.	PSO1	U
CO-2	Use the liquid drop model and the law of radioactive decay to describe alpha-decay, beta-decay, fission and fusion, predict decay reactions and calculate the energy release in nuclear decays	PSO1,4	U,R
CO-3	It will teach the students about the spin parity concept & magic no. Related to shell.	PSO1	U
CO-4	About the scattering process how it will occur.	PSO1	AC
CO-5	Explain the experimental evidence for quarks, gluons, quark confinement, asymptotic freedom, sea quarks, the running coupling constant and colour charge	PSO1	U, AC

Course Title	Semester-IV / Core Course X ADVANCED PHYSICS		
Code	PGPM		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Able to use radio astronomical data to measure physical properties of astronomical targets.	PSO1	U
CO-2	Identify and solve basic communication problems, analyse transmitter and receivers.	PSO1	AN, AC
CO-3	Demonstrate measuring of basic medical parameters	PSO4	U
CO-4	Analyse the radio channel characteristics and the cellular principles	PSO4	U, AC
CO-5	Ability to analyse improved data services in cellular communication.	PSO4	U, AC

Course Title	Semester-IV / ELECTIVE COURSE-V ADVANCED EXPERIMENTAL TECHNIQUES		
Code	PGPE5		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Understand the principle and structure of optical fibers.	PSO-2, 4	U
CO-2	Understand the working principle of fiber optical sources and couplers and apply it in the optical communication systems.	PSO-2	U
CO-3	Apply the fundamental principles of optics and light wave to design optical fiber communication systems.	PSO-4	U
CO-4	Understand different analog and digital transmission systems.	PSO-2	R
CO-5	Understand and apply the concepts of coherent optical modulation and detection techniques.	PSO-4	U, AC

Course Title	Semester-IV / ELECTIVE COURSE-V BASICS OF COMPUTATIONAL NANOELECTRONICS		
Code	PGPE5		
CO No.	Course Outcomes	PSOs Addressed	Cognitive Level
CO-1	Discuss the types of nanotechnology, molecular technology and the preparation of nano materials.	PSO-2, 4	U
CO-2	Explains the fundamental of the devices such as logic devices, field effect devices, and spintronics.	PSO-2	U
CO-3	Describe the concepts of silicon MOSFET and Quantum Transport Devices.	PSO-4	U
CO-4	Summarize the types, synthesis, interconnects and applications of carbon nano tubes.	PSO-2	R
CO-5	Explain the concepts, functions, fabrications and applications of molecular electronics	PSO-4	U