

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	merge with competency in the subject of Physics and apply knowledge to cater to the needs of Society / Employer / Institution / Own Business Enterprise
PO-2	imbibe analytical/critical/logical/innovative thinking skills in the various fields of theoretical and experimental Physics
PO-3	acquire distinct traits and ethics with high professionalism to gain a broader insight into the domain concerned for nation building
PO-4	recognize the need for and have an ability to engage in life-long learning and be able to demonstrate knowledge of contemporary issues

PSO No.	Programme Specific Outcomes Upon completion of these courses the student would
PSO-1	develop the scientific attitudes among students to enhance rational reasoning, critical thinking and develop skills to face various aspects of life like higher studies, research activities, various competitive exams, entrepreneurship and employment
PSO-2	acquire the in-depth knowledge in theoretical and experimental Physics.
PSO-3	produce graduate with leadership quality and to integrate their knowledge with Computer Science, Electronics, Chemistry and mathematics to face challenges taking place rapidly at global level.

Course Title	MECHANICS, PROPERTIES OF MATTER AND ACOUSTICS	
CODE	18PHUC101	
CO No.	Course Outcomes	Knowledge Level
CO-1	Learn the basic concepts of Rigid body dynamics, Gravitation, Properties of Matter and Acoustics	K1
CO-2	Understand the concept of Radius of Gyration, Moment of Inertia, Elasticity, Surface tension and Types of Vibration	K2
CO-3	Understand the principles of Low Pressure Gauges and their measurements	K2
CO-4	Understand the applications of Acoustics and Ultrasonics	K2
CO-5	Apply the basic concepts in real world problems.	K3

Course Title	HEAT, THERMODYNAMICS AND STATISTICAL MECHANICS	
CODE	18PHUC102	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the concepts of Heat, Thermodynamics and Statistical Thermodynamics.	K1
CO-2	Procure basic knowledge about real gas, specific heat and Entropy	K2
CO-3	Get ideas about liquefaction of gases	K2
CO-4	Understand the laws of thermal radiation.	K2
CO-5	Acquire knowledge in classical and Quantum Statistics	K3

Course Title	ELECTRICITY AND MAGNETISM	
CODE	18PHUC203	
CO No.	Course Outcomes	Knowledge Level
CO-1	Know the basic concepts of Electricity and Magnetism	K1
CO-2	Understand the various phenomenon in Electricity and Magnetism	K2
CO-3	Understand Circuit analysis and network theorems	K2
CO-4	Explain the Dynamics of Charged Particles	K2
CO-5	Apply the acquired knowledge to solve the problems.	K3

Course Title	NUCLEAR AND PARTICLE PHYSICS	
CODE	18PHUC204	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the basics concepts of atomic structure and general static properties of atomic nuclei	K1
CO-2	Analyze different nuclear models knowing the properties of nuclei	K2
CO-3	Analyze the various techniques of nuclear radiation detectors	K2
CO-4	Apply the knowledge of radioactivity to realize the concept of artificial radioactivity	K3
CO-5	Acquire knowledge on the kinematics of high energy collision of nuclear elementary particles.	K3

Course Title	CORE PRACTICAL I	
CODE	18PHUCP01	
CO No.	Course Outcomes	Knowledge Level
CO-1	Determine the various properties of materials	K4
CO-2	Apply the knowledge of Physics fundamentals	K3
CO-3	Find the errors and adjust it to get the nearer ideal readings using specific measurement techniques	K3
CO-4	Quantify the measurement of the reflection or transmission properties of a material	K4
CO-5	Determine the characteristics of the electronic devices	K5

Course Title	ALLIED PHYSICS PAPER I - MECHANICS, HEAT, SOUND, SOLAR PHYSICS, ELECTRICITY AND MAGNETISM	
CODE	18PHUA101	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the basic concepts in mechanics, Solar energy, electricity and magnetism.	K1
CO-2	Investigate the effects of gravity and elasticity	K2
CO-3	Explore the concepts of heat and thermodynamics	K2
CO-4	Provide the opportunity to integrate theory and the application of it in everyday experience	K3
CO-5	Understand the Fundamental properties of electricity and magnetism	K3

Course Title	ALLIED PHYSICS PAPER II –MODERN PHYSICS, ELECTRONICS AND DIGITAL ELECTRONICS	
CODE	18PHUA202	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand new types of Lasers for commercial applications	K2
CO-2	Understand the concepts in nuclear and particle Physics	K2
CO-3	Procure knowledge in electronic devices and systems	K2
CO-4	Understand the principles of modern communication systems	K2
CO-5	Analyze and construct various digital circuits.	K3

Course Title	ALLIED PHYSICS PRACTICALS	
CODE	18PHUAP01	
CO No.	Course Outcomes	Knowledge Level
CO-1	Determine the various properties of materials	K4
CO-2	Apply the knowledge of Physics fundamentals	K3
CO-3	Find the errors and adjust it to get the nearer ideal readings using specific measurement techniques	K3
CO-4	Quantify the measurement of the reflection or transmission properties of a materials	K4
CO-5	Determine the characteristics of the electronic devices	K5

Course Title	OPTICS AND SPECTROSCOPY	
CODE	18PHUC301	
CO No.	Course Outcomes	Knowledge Level
CO-1	Describe the general method for analyzing and predicting the aberrations in lens and to find the velocity of light.	K1
CO-2	Understand the basic concepts of the interference through experiments with visible lights.	K2
CO-3	Interpret various Diffraction techniques to determine the wavelength of light.	K2
CO-4	Infer the basic concept of polarization and their application in the field of Photonics.	K2
CO-5	Apply various aspects of molecular spectroscopy analysis relevant to research and industry.	K3

Course Title	CORE PRACTICAL II	
CODE	18PHUAP01	
CO No.	Course Outcomes	Knowledge Level
CO-1	Apply the knowledge of Physics fundamentals	K4
CO-2	Determine the various properties of materials	K3
CO-3	Find the errors using error correction methods	K3
CO-4	Quantify the measurement of the physical properties of a materials	K4
CO-5	Determine the characteristics of the electronic devices	K5

Course Title	ALLIED PHYSICS PAPER I - MECHANICS, HEAT, SOUND, SOLAR PHYSICS, ELECTRICITY AND MAGNETISM	
CODE	18PHUA101/18PHUA301	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the basic concepts in mechanics, Solar energy, electricity and magnetism.	K1
CO-2	Investigate the effects of gravity and elasticity	K2
CO-3	Explore the concepts of heat and thermodynamics	K2
CO-4	Provide the opportunity to integrate theory and the application of it in everyday experience	K3
CO-5	Understand the Fundamental properties of electricity and magnetism	K3

Course Title	ALLIED PHYSICS PAPER II –MODERN PHYSICS, ELECTRONICS AND DIGITAL ELECTRONICS	
CODE	18PHUA202/18PHUA402	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand new types of Lasers for commercial applications	K2
CO-2	Understand the concepts in nuclear and particle Physics	K2
CO-3	Procure knowledge in electronic devices and systems	K2
CO-4	Understand the principles of modern communication systems	K2
CO-5	Analyse and construct various digital circuits.	K3

Course Title	ALLIED PHYSICS PRACTICALS	
CODE	18PHUAP01	
CO No.	Course Outcomes	Knowledge Level
CO-1	Apply the knowledge of Physics fundamentals	K4
CO-2	Determine the various properties of materials	K3
CO-3	Find the errors using error correction methods	K3
CO-4	Quantify the measurement of the physical properties of a materials	K4
CO-5	Determine the characteristics of the electronic devices	K5

Course Title	MATHEMATICAL PHYSICS	
CODE	18PHUC507	
CO No.	Course Outcomes	Knowledge Level
CO-1	Gain knowledge on vectors a basic mathematical structure which is essential in solving problems in various branches of Physics as well as in engineering.	K1
CO-2	Solve ordinary differential equations that are common in the Physical Sciences	K2
CO-3	Develop an understanding of how to model a given physical phenomena such as pendulum motion, rocket motion, stretched string etc., into set of ODE's, PDE's and solve them.	K2
CO-4	Explore the students to applied mathematics and mathematical modelling that enhance them for further studies.	K2
CO-5	Learn the beta, gamma functions and Dirac delta function its properties and their applications in doing integrations, which have applications in various branches of Physics, especially quantum mechanics	K3

Course Title	ATOMIC AND SOLID STATE PHYSICS	
CODE	18PHUC508	
CO No.	Course Outcomes	Knowledge Level
CO-1	Recognize various quantum numbers associated with vector atom model and explain the change in behaviour of atomic spectral lines on externally applied magnetic fields	K1
CO-2	Differentiate between different crystal structures in terms of the crystal lattice and explain the concepts of reciprocal lattice	K2
CO-3	Interpret the characteristics of various crystal defects and be familiar with the crystal growth mechanisms and techniques	K2
CO-4	Apply the basic theories to describe electronic behavior in the metals and familiar with the unusual properties that are exhibited by superconducting materials	K3
CO-5	Develop an understanding of the unique properties and characteristics of dielectrics and insulating based materials	K3

Course Title	ELECTRONIC CIRCUITS AND DEVICES	
CODE	18PHUE509	
CO No.	Course Outcomes	Knowledge Level
CO-1	Know the basic principles about semiconductor diodes	K1
CO-2	Understand the various phenomena of Transistor circuits	K2
CO-3	Understand different types of amplifier.	K2
CO-4	Analyze the working of oscillator and multivibrators.	K2
CO-5	Apply the acquired knowledge to solve the problems	K3

Course Title	PROGRAMMING IN 'C' AND 'C++'	
CODE	18PHUE501	
CO No.	Course Outcomes	Knowledge Level
CO-1	Improve their understanding and ability to use data types, variables and arithmetic operators available in C program	K1
CO-2	Able to understand the basic oops concepts and control structures of C++ program	K2
CO-3	Acquire the knowledge of classes and objects to implement oops concepts in C++ program	K2
CO-4	Learn to implement constructors, destructors and inheritance in writing a C++ program	K3
CO-5	Illustrate the concept of function overloading, operator overloading, virtual functions and develop the understanding of working with files	K3

Course Title	CLASSICAL MECHANICS AND RELATIVITY	
CODE	18PHUC610	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand and apply Newton's laws of motion to simple physical problems of interest.	K1
CO-2	Build strong knowledge about different types of constraints and apply it to formulate and solve problems using Lagrangian equation of motion.	K2
CO-3	Gain a clear understanding of vibrational calculus and apply Hamiltonian formalisms to solve real world problems.	K2
CO-4	Demonstrate the knowledge of central force problems and classical scattering theory.	K3
CO-5	Explain the fundamental concepts in relativity	K3

Course Title	QUANTUM MECHANICS	
CODE	18PHUE611	
CO No.	Course Outcomes	Knowledge Level
CO-1	Introduce wave properties of Matter, Uncertainty Principle, concept of Angular Momentum and Spin	K1
CO-2	Study about Basic concepts in Quantum Mechanics such as the Schrodinger equation, wave function and its statistical interpretation	K2
CO-3	Acquire Basic knowledge on operator used in Quantum Mechanics	K2
CO-4	Solve Schrodinger equation for one electron in simple potential function	K3
CO-5	Apply the quantum mechanical concepts to solve hydrogen atom and simple harmonic oscillator problem with computational solution using different software.	K3

Course Title	MICROPROCESSOR AND INTRODUCTION TO IoT	
CODE	18PHUE602	
CO No.	Course Outcomes	Knowledge Level
CO-1	Understand the general architecture of a microcomputer system and architecture of 8085 microprocessor and its operations	K1
CO-2	Acquire knowledge of various addressing modes and instructions of the 8085 microprocessor	K2
CO-3	Interpret the operations of microprocessor using timing diagrams	K2
CO-4	Apply the interfacing concepts to Interface memory & various I/O devices with 8085 microprocessor	K3
CO-5	Develop assembly language programs of 8085 microprocessor and recognize the key mechanisms that make up an IoT system	K3

Course Title	COMMUNICATION ELECTRONICS	
CODE	18PHUE603	
CO No.	Course Outcomes	Knowledge Level
CO-1	Know the basic concepts of Modulation and demodulation	K1
CO-2	Understand the various phenomenon in digital communication	K2
CO-3	Understand about broad band communication system	K2
CO-4	Acquire the basic knowledge on fiber optics and satellite communication	K2
CO-5	Apply the acquired knowledge in new situation.	K3

Course Title	CORE PRACTICAL I	
CODE	20PHUAP01	
CO No.	Course Outcomes	Knowledge Level
CO-1	Determine the various properties of materials	K4
CO-2	Apply the knowledge of Physics fundamentals	K3
CO-3	Find the errors and adjust it to get the nearer ideal readings using specific measurement techniques	K3
CO-4	Quantify the measurement of the reflection of transmission properties of a materials	K4
CO-5	Determine the characteristics of the electronic devices	K5

Course Title	CORE PRACTICAL III	
CODE	18PHUCP03	
CO No.	Course Outcomes	Knowledge Level
CO-1	Explain Basic laws and theories of diode, transistors, operational amplifiers, etc.,	K1
CO-2	Describe the basic concepts and its physical significance	K2
CO-3	Implement the basic theory knowledge to set up experiments	K2
CO-4	Construct amplifier, oscillator and multivibrator circuits	K3
CO-5	Analyse the result qualitatively and quantitatively	K3

Course Title	CORE PRACTICAL IV	
CODE	18PHUCP04	
CO No.	Course Outcomes	Knowledge Level
CO-1	Explain the basic laws of electronic components and their performance	K1
CO-2	Analyse a given electronic component using basic test and measuring instruments	K2
CO-3	Design and analyze of analog circuits	K2
CO-4	Design and construct the intergrated circuits that perform the desired logic operation	K3
CO-5	Use the basic knowledge of analog and digital electronics to evaluate the given electronic circuits.	K3

Course Title	ELECTIVE PRACTICAL	
CODE	18PHUEP01	
CO No.	Course Outcomes	Knowledge Level
CO-1	Explain the procedure of problem-solving using computer	K1
CO-2	Outline an algorithmic solution for a given problem	K2
CO-3	Write a C, C++ and Scilab program for a given algorithm	K2
CO-4	Debug a given C, C++ and Scilab program	K3
CO-5	Interpret and check a given C, C++ and Scilab program	K3