DEPARTMENT OF PHYSICS WITH CA

PROGRAM OUTCOMES

Students graduating with a B.Sc. in Physics should be able to:

PO1. Students will demonstrate proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics.

PO2.Students will demonstrate knowledge of selected topics from classical mechanics, quantum mechanics, quantum mechanics, electromagnetism, quantum mechanics, and thermal physics, and be able to apply this knowledge to analyze a broad range of physical phenomena.

PO3.Students will show that they have learned laboratory skills, enabling them to take measurements in a physics laboratory and analyze the measurements to draw valid conclusions.

PO4.Students will be capable of oral and written scientific communication, and will prove that they can think critically and work independently.

PROGRAM SPECIFIC OUTCOMES

PSO-1.Students will demonstrate proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics.

PSO-2. Students will demonstrate knowledge of classical mechanics, electromagnetism, quantum mechanics, and thermal physics, and be able to apply this knowledge to analyze a variety of physical phenomena.

PSO-3.Students will show that they have learned laboratory skills, enabling them to take measurements in a physics laboratory and analyze the measurements to draw valid conclusions.

PSO-4. Students will be capable of oral and written scientific communication, and will prove that they can think critically and work independently.

COURSE OUTCOMES

CO1. Understand and define the laws involved in mechanics

CO2. Gain deeper understanding of mechanics and its fundamental concepts

CO3. Explain the notion of degrees of freedom and identify them for a given mechanical system.

MECHANICS AND PROPERTIES OF MATTER

ALLIED MATHEMATICS-I

CO1. Understand the concepts of algebra,trigonometry,differitiation,integration
CO2. Apply the mathematical knowledge to solve problems

THERMAL PHYSICS AND ACOUSTICS

CO1. Learning the basics concepts of elasticity, surface tension, gravitation, viscosity and sound
CO2. Understand the concepts of properties of matter and to recognise their applications in various real problems
CO3. Describe the key evidence for the breakdown of the classical description of the properties of matter
CO4. Recall the principles and basic equations and apply them to unseen problems
CO5. Formulate the equations for unique cases in the diverse categories of material systems

ALLIED MATHS-II

CO1. Understand the concepts of vector differentiation,laplace transforms differitiation,fourier series
CO2. Apply the mathematical knowledge to solve problems

PHYSICS CORE PRACTICAL-I

CO1. Apply knowledge of mathematics and physics fundamentals and an instrumentation to arrive solution for various problems.
CO2. Understand the usage of basic laws and theories to determine various properties of the materials given.
CO3. Understand the application side of the experiments
CO4. Use standard methods to calibrate the given low range voltmeter and ammeter and to measure resistance of the given coil and various physical quantities.
CO5. Use of basic laws to study the spectral properties and optical properties of the given prism.

OPTICS

CO1. List the basic ideas in image formation and the defects involved.
CO2. Understand the central concepts and basic formalisms of interference, ffraction, polarization and basics of spectroscopy.
CO3. Use of tools needed to formulate problems in optics and spectroscopy.
CO4. Gain Fundamental knowledge in lasers, holography and Raman effect.
CO5. To impart knowledge related to the concepts of spectroscopy.

BASIC ELECTRONICS

CO1. Be familiar with the basic concepts of construction and working of electronic devices and optical fibers
CO2. Apply the knowledge to understand the working of amplifiers, oscillators and multivibrators
CO3. Understand the principles of modulation and demodulation
CO4. Apply the knowledge to understand the working of special types of diodes
CO5. Apply the principles of feedback in amplifiers and oscillators

DATA STRUCTURE

CO1. Describe how arrays, records, linked structures, stacks; queues, trees, and graphs are represented in memory and used by algorithms

CO2. Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs

CO3. Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs

CO4. Compare alternative implementations of data structures with respect to performance

OBJECT ORIENTED PROGRAMMING USING C++

CO1. Understand the fundamentals of C++ programming
CO2. Understand the concepts of operators and arrays
CO3. Understand the role of structure and pointers in the program.
CO4. Develop a greater understanding of the issues involved in programming language design and implementation

CO5. Write C program for simple applications of real life using structures

ATOMIC PHYSICS

CO1. Explore the fundamental concepts of physics

CO2. Acquire knowledge of the fundamental physics underpinning atomic and nuclear physics

CO3. Understand the concepts and potential applications of atomic and nuclear physics

CO4. Carry out the practical by applying these concepts

CO5. Get depth knowledge of physics in day today life.

DATA BASE MANAGEMENT SYSTEM

CO1. Define program-data independence, data models for database systems, database schema and database instances

CO2. Identify Structure Query Language statements used in creation and manipulation of Database

CO3. Identify the methodology of conceptual modeling through Entity Relationship model

CO4. Analyze and design a real database application

OPERATING SYSTEM

CO1. Allocate Main Memory based on various memory management techniques

CO2. Compare Memory allocation using Best fit, Worst fit, and first fit policies

CO3. Apply page replacement policies for dynamic memory management

CO4. Compare various device scheduling algorithms

CO1. Apply knowledge of mathematics and physics fundamentals and an instrumentation to arrive solution for various problems.

CO2. Understand the usage of basic laws and theories to determine various properties of the materials given.

CO3. Understand the application side of the experiments

CO4. Use standard methods to calibrate the given low range voltmeter and ammeter and to measure resistance of the given coil and various physical quantities.

CO5. Use of basic laws to study the spectral properties and optical properties of the given prism.

PHYSICS CORE PRACTICAL-II

NUCLEAR AND PARTICLE PHYSICS

CO1. Acquire knowledge of the fundamental physics underpinning atomic and nuclear physics

CO2. Understand the concepts and potential applications of atomic and nuclear physics

CO3. Apply general considerations of quantum physics to atomic and nuclear system

CO4. Analyze production and decay reactions for fundamental particles

O5. Expand and evaluate the theoretical predictions for nuclear reactions.

SOLID STATE PHYSICS

CO1. Be able to account for interatomic forces and bonds

CO2. Have a basic knowledge of crystal systems and spatial symmetries

CO3. Be able to account for how crystalline materials are studied using diffraction, including concepts like the Ewald sphere, form factor, structure factor, and scattering amplitude.

CO4. Be able to perform structure determination of simple structures

CO5. Understand the concept of reciprocal space and be able to use it as a tool know the significance of Brillouin zones

PROGRAMMING IN JAVA

CO1.Identify Java language components and how they work together in applications

CO2. Understand how to design GUI components with the Java Swing API

CO 3. Learn Java generics and how to use the Java Collections API

CO 4. Understand how to design applications with threads in Java.

DISCRETE MATHEMATICS

CO1. To appreciate the basic principles of Boolean algebra, Logic, Set theory,

CO2 . Permutations and combinations and Graph Theory.

CO3 . Be able to construct simple mathematical proofs

CO4 . Be able to understand logical arguments and logical constructs. Have a better understanding of sets, functions, and relations.

ELECTRICITY AND ELECTROMAGNETISM

CO1. Recognize basic terms in electricity and magnetism

CO2. Understand the laws of electrostatics and magnetostatics

CO3. Apply theorems to construct and solve electrical circuits.

CO 4. Ability to design and conduct experiments as well as to analyze and interpret data

CO 5. Build up strong problem solving skills by effectively formulate a circuit problem into a mathematical problem using circuit laws and theorems

RELATIVITY AND QUANTUM MECHANICS

CO 1. Provide the students with an idea of relativity which are essential tools in problem solving.

CO2. Provide elementary ideas on classical mechanics and will be able to write equations for real time problems using classical mechanics.

CO3. Recognize basic terms in Quantum Mechanics.

CO4. Understand the basic principles of quantum particles.

CO5. Apply basics to construct and solve one particle equation.

CO6. Ability to design and construct particle equation in the free and bound states as well as to analyze and interpret the results.

CO7. To understand the fundamentals and concepts in the special theory of relativity

MATHEMATICAL AND NUMERICAL METHODS

CO1. Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems.

CO2. Apply numerical methods to obtain approximate solutions to mathematical problems.

CO3. Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations.

MICROPROCESSOR FUNDAMENTALS

CO1. Basic ideas on microprocessor, memory and I/O devices

CO2. Be familiar with the basic concepts of microprocessor architecture and interfacing

CO3. To impart skills in the programming instruction sets of microprocessor

CO4. Apply the programming instructions to perform simple programs using microprocessor

CO5. Finding solution for real time applications

PHYSICS CORE PRACTICAL –(GENERAL)

CO1: Measure the temperature coefficient of resistance of a given wire by P.O box method.

CO2: Determine the frequency of the tuning fork by using Sonometer

CO3: Determination of specific resistance of unknown coil by Carey Foster Bridge

CO4: Compare the emf's of two given primary cells using a potentiometer.

CO5: Analyze the magnetic dipole moment of a bar magnet and horizontal intensity of earth's magnetic field using a deflection magnetometer.

CO6: Measure the magnetic dipole moment of a bar magnet using a deflection magnetometer by Tan C position.

PHYSICS CORE PRACTICAL -ELECTRONICS

CO1. Basic laws and theories involving diodes, transistors, solar cells, etc.,

CO2. Understand the given concepts and its physical significance

CO3. Apply the theory to design the basic electrical circuits

CO4. Analyze the response of these devices using the circuits constructed.
Qualitative and quantitative analysis of chlorophyll, proteins, etc.,

CO5. Use of these basic circuits to create amplifier circuits, oscillator, regulated power supplies etc.,

PHYSICS CORE PRACTICAL -MICROPROCESSOR

CO1. Defining the primary functions of 8085 ALP and basic principles of C programming

CO 2. Understand the given concepts and its physical significance

CO 3. Apply the theory to find the solutions of practical problems

CO 4. Analyze the problem studied through analytical calculation