



VIDHYA SAGAR WOMEN'S COLLEGE

(Affiliated to University of Madras)

Accredited at 'A' Grade by NAAC

DEPARTMENT OF PHYSICS WITH CA

PROGRAMME OUTCOME:

- PO1** Explain the fundamental principles behind all applied sciences and computer technologies.
- PO2.** Understand the world around us, including the modern technological advancements.
- PO3.** Emphasize on developing computer programming skills, architecture, networks, etc. by using Computer science modules.
- PO4.** Become a knowledgeable and skilled human which make them employable and to become an entrepreneur.

PROGRAMME SPECIFIC OUTCOME:

- PSO1.** Students will demonstrate proficiency in mathematics and the mathematical concepts needed for a proper understanding of physics.
- PSO2.** 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.
- PSO3.** 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.
- PSO4.** Students will be capable of oral and written scientific communication, and will prove that they can think critically and work independently.

COURSE OUTCOME:

CO1: TAMIL –I: The course focuses on culture and traditional way of living, proverbs and folk songs. In addition to verbal literature, life style of ancient people and their culture, society and tradition were also been focussed. Finally, the subject motivates the students for creative writing, poetry making, and learning grammar are also included.

CO2: ENGLISH – I: At the end of the course the students are able to read, interpret, and write about a diverse range of texts in English, for example prose, poetry, and drama. On the basis of careful and close reading, the students understand the text analytically and critically. The students can participate clearly and appropriately through spoken and written forms. Further, students develop abilities in grammar, oral skills, reading, writing and study skills.

CO3: MECHANICS AND PROPERTIES OF MATTER: Understand and define the laws involved in mechanics. Gain deeper understanding of mechanics and its fundamental concepts Explain the notion of degrees of freedom and identify them for a given mechanical system.

CO4: ALLIED MATHEMATICS: understand the concepts of algebra, integration and integration. Apply the mathematical knowledge to solve problems

CO6: BASIC PHYSICS: Identify significant components of physical systems and describe their interactions. Apply knowledge of fundamental physical laws to analyze behavior and properties of a variety of physical systems. Integrate technical and cognitive skills in reviewing, analyzing and synthesizing information to address specific themes in physics. Communicate knowledge and ideas clearly and coherently by oral and written means.

CO7: ESSENTIALS OF LANGUAGE AND COMMUNICATION SKILLS: It helps the student to develop language acquisition and introduce them to range of vocabulary and helping them to communicate with ease and clarity.

CO8: TAMIL-II: The course focuses on culture and traditional way of living, proverbs and folk songs. In addition to verbal literature, life style of ancient people and their culture, society and tradition were also been focussed. Finally, the subject motivates the students for creative writing, poetry making, and learning grammar are also included.

CO9: ENGLISH-II: After successful completion of this course the students develop their skills in the areas of academic reading, writing, speaking, and listening. The students can apply

reading and listening strategies to comprehend and evaluate a range of academic texts and talks. Identify relevant information from academic texts and talks, and utilise effective summarising techniques.

CO10: THERMAL PHYSICS AND ACOUSTICS: Learning the basics concepts of elasticity, surface tension, gravitation, viscosity and sound. Understand the concepts of properties of matter and to recognize their applications in various real problems. Describe the key evidence for the breakdown of the classical description of the properties of matter. Recall the principles and basic equations and apply them to unseen problems. Formulate the equations for unique cases in the diverse categories of material systems.

CO11: ALLIED MATHS-II: Understand the concepts of vector differentiation, Laplace transforms, differentiation, Fourier series. Apply the mathematical knowledge to solve problems.

CO12: ASTRO PHYSICS: Recognize scientific and quantitative methods and the differences between these approaches and other methods of inquiry used in modern astrophysics. Identify and recognize the differences among competing modern astrophysical scientific theories. Demonstrate the ability to translate, interpret, and extrapolate the most important scientific models governing modern astrophysics, the practices and methodologies used by both modern and historic astronomers in constructing astrophysical models. Further develop critical/logical thinking, scientific reasoning, and problem-solving skills in the area of astrophysics

CO13: ESSENTIALS OF SPOKEN AND PRESENTATION SKILLS: It helps a student to keep a presentation interesting. It also helps the presenter communicate with confidence and motivate them to create variety and speak with optimal audibility during presentation. It further helps the students to learn verbal and non-verbal gestures.

CO14: PHYSICS CORE PRACTICAL-I: Apply knowledge of mathematics and physics fundamentals and an instrumentation to arrive solution for various problems. Understand the usage of basic laws and theories to determine various properties of the materials given. Understand the application side of the experiments. Use standard methods to calibrate the given low range voltmeter and ammeter and to measure resistance of the given coil and various physical quantities. Use of basic laws to study the spectral properties and optical properties of the given prism.

CO15: OPTICS: List the basic ideas in image formation and the defects involved. Understand the central concepts and basic formalisms of interference, diffraction, polarization and basics of spectroscopy. Use of tools needed to formulate problems in optics and spectroscopy. Gain Fundamental knowledge in lasers, holography and Raman Effect. Gain knowledge related to the concepts of spectroscopy.

CO17: BASIC ELECTRONICS: Be familiar with the basic concepts of construction and working of electronic devices and optical fibers. Apply the knowledge to understand the working of amplifiers, oscillators and multivibrators. Understand the principles of modulation and demodulation. Apply the knowledge to understand the working of special types of diodes Apply the principles of feedback in amplifiers and oscillators.

CO18: DATA STRUCTURE: Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithms. Describe common applications for arrays, records, linked structures, stacks, queues, trees, and graphs. Write programs that use arrays, records, linked structures, stacks, queues, trees, and graphs. Compare alternative implementations of data structures with respect to performance.

CO19: OBJECT ORIENTED PROGRAMMING USING C++: Understand the fundamentals of C++ programming. Understand the concepts of operators and arrays. Understand the role of structure and pointers in the program. Develop a greater understanding of the issues involved in programming language design and implementation.

CO20: COMPUTER CORE PRACTICAL-III-DATA STRUCTURES LAB: Gain the knowledge of writing programs and Implement PUSH, POP operations of stack using Arrays and Pointers. Implement add, delete operations of a queue using Arrays and Pointers.

Addition of two polynomials using Arrays and Pointers. Binary tree traversals using recursion. Depth First Search and Breadth first Search for Graphs using Recursion.

CO21: COMPUTER CORE PRACTICAL-IV-C++ PROGRAMMING: Gain the knowledge of writing programs using C++ language and apply to do mathematical operations like finding the area of a triangle, Solving Quadratic equation, finding the average of 'n' numbers and to copy the content of one file to another.

CO22: PERSONALITY ENRICHMENT – I: Leadership and communication skills. Team work learning to connect and work with others to achieve goals. Learn to balance confidence with humility. Acquire Self -awareness and life skills.

CO23: ATOMIC PHYSICS: Explore the fundamental concepts of physics. Acquire knowledge of the fundamental physics underpinning atomic and nuclear physics. Understand the concepts and potential applications of atomic and nuclear physics. Carry out the practical by applying these concepts. Get depth knowledge of physics in day today life.

CO24: INTEGRATED ELECTRONICS: Through knowledge on different number systems. The skill to simplify the logics using Karnaugh map and Boolean algebra. Detailed knowledge in storing and retrieving a data through mux and demux .The skill to customize the counters to the need through serial and parallel counters.

CO25: DATA BASE MANAGEMENT SYSTEM: Define program-data independence, data models for database systems, database schema and database instances. Identify Structure Query Language statements used in creation and manipulation of Database. Identify the methodology of conceptual modelling through Entity Relationship model. Analyze and design a real database application.

CO26: OPERATING SYSTEM: Allocate Main Memory based on various memories management techniques. Compare Memory allocation using Best fit, Worst fit, and first fit policies. Apply page replacement policies for dynamic memory management. Compare various device scheduling algorithms.

CO27: PERSONALITY ENRICHMENT LEVEL– II: Develop intelligent behaviour, moral behaviour, motives and emotion, values and attitudes. Learn how to be a professional person with body language, gesture, posture, language proficiency. Manifest a wholesome, personality inclusive of physical, social, emotional, intellectual and moral dimensions. Helps to improve student's versatility and set an objective on the basis of who we are and what we have.

CO28: ENVIRONMENTAL STUDIES: Learn About the Basics of Environment and Its Composition. Creates awareness of Environment Laws prescribed by government and To Learn What Biodiversity Is and How to protect and Preserve them.

CO29: COMPUTER CORE PRACTICAL V - RDBMS USING VB PRACTICAL Uses VB as the front-end tool and any RDBMS (Oracle or MySQL or any standard RDBMS) as the back-end tool. Create database and performing the operations using a Menu Driven program:
a) Insertion, (b) Deletion, (c) Modification, (d) Generating simple reports.

CO30: PHYSICS CORE PRACTICAL-II: Apply knowledge of mathematics and physics fundamentals and an instrumentation to arrive solution for various problems. Understand the usage of basic laws and theories to determine various properties of the materials given. Understand the application side of the experiments. Use standard methods to calibrate the given low range voltmeter and ammeter and to measure resistance of the given coil and various physical quantities. Use of basic laws to study the spectral properties and optical properties of the given prism.

CO31: NUCLEAR AND PARTICLE PHYSICS: Acquire knowledge of the fundamental physics underpinning atomic and nuclear physics. Understand the concepts and potential applications of atomic and nuclear physics. Apply general considerations of quantum physics to atomic and nuclear system. Analyses production and decay reactions for fundamental particles. Expand and evaluate the theoretical predictions for nuclear reactions.

CO32: SOLID STATE PHYSICS: Be able to account for interatomic forces and bonds. Have a basic knowledge of crystal systems and spatial symmetries. 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. Be able to perform structure determination of simple structures. Understand the concept of reciprocal space and be able to use it as a tool know the significance of Brillouin zones.

CO33: PROGRAMMING IN JAVA: Identify Java language components and how they work together in applications. Understand how to design GUI components with the Java Swing API. Learn Java generics and how to use the Java Collections API. Understand how to design applications with threads in Java.

CO34: DISCRETE MATHEMATICS: Appreciate the basic principles of Boolean algebra, Logic, Set theory, Permutations and combinations and Graph Theory. Be able to construct simple mathematical proofs.

CO35: VALUE EDUCATION: Students learn the importance of values which acts as guiding factor in their routine life. Students will be understood Salient values for life like Truth, commitment, honesty and integrity, forgiveness and love, empathy and ability to sacrifice, care, unity etc. Analyze the role of media in value building and Gain awareness about social evils and how to overcome from that.

CO36: ELECTRICITY AND ELECTROMAGNETISM: Recognize basic terms in electricity and magnetism. Understand the laws of electrostatics and magnetostatics. Apply theorems to construct and solve electrical circuits. Ability to design and conduct experiments as well as to analyze and interpret data. Build up strong problem-solving skills by effectively formulate a circuit problem into a mathematical problem using circuit laws and theorems

CO37: RELATIVITY AND QUANTUM MECHANICS: Provide the students with an idea of relativity which are essential tools in problem solving. Provide elementary ideas on classical mechanics and will be able to write equations for real time problems using classical mechanics. Recognize basic terms in Quantum Mechanics. Understand the basic principles of quantum particles. Apply basics to construct and solve one particle equation. Ability to design and construct particle equation in the free and bound states as well as to analyze and interpret the results. Understand the fundamentals and concepts in the special theory of relativity.

CO38: MATHEMATICAL AND NUMERICAL METHODS: Demonstrate understanding of common numerical methods and how they are used to obtain approximate solutions to otherwise intractable mathematical problems. Apply numerical methods to obtain approximate solutions to mathematical problems. 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.

CO39: MICROPROCESSOR FUNDAMENTALS: Basic ideas on microprocessor, memory and I/O devices. Be familiar with the basic concepts of microprocessor architecture and interfacing. To impart skills in the programming instruction sets of microprocessors. Apply the programming instructions to perform simple programs using microprocessor. Finding solution for real time applications.

CO40: PHYSICS CORE PRACTICAL VI – (GENERAL): Measure the temperature coefficient of resistance of a given wire by P.O box method. Determine the frequency of the tuning fork by using Sonometer. Determine the specific resistance of unknown coil by Carey Foster Bridge. Compare the emf of two given primary cells using a potentiometer. Analyze the magnetic dipole moment of a bar magnet and horizontal intensity of earth's magnetic field using a deflection magnetometer. Measure the magnetic dipole moment of a bar magnet using a deflection magnetometer by Tan C position.

CO40: PHYSICS CORE PRACTICAL VII –ELECTRONICS: Apply basic laws and theories involving diodes, transistors, solar cells, etc., Understand the given concepts and its physical significance. Apply the theory to design the basic electrical circuits. Analyze the response of these devices using the circuits constructed. Qualitative and quantitative analysis of chlorophyll, proteins, etc. Use of these basic circuits to create amplifier circuits, oscillator, regulated power supplies etc.

CO41: PHYSICS CORE PRACTICAL VIII –MICROPROCESSOR: Define the primary functions of 8085 ALP and basic principles of C programming. Understand the given concepts and its physical significance. Apply the theory to find the solutions of practical problems. Analyze the problem studied through analytical calculation.