DEPARTMENT OF INFORMATION TECHNOLOGY

3.1.1 Course Outcomes: R23

Course Title with Code	CO'S	Statement
C101 COMMUNICATIVE ENGLISH	CO1	Understand the context, topic, and pieces of specific information from social or Transaction dialogues.
	CO2	Apply grammatical structures to formulate sentences and correct word forms.
	CO3	Create and design proper structural English for writing.
	CO4	Evaluate LSRW Skills for global comparatives
	CO5	Create a coherent paragraph, essay, and resume.
C102 CHEMISTRY	CO1	Illustrate the Schrodinger wave equation and molecular orbital theory
	CO2	Use and properties of semi conductors and Nano materials.
	CO3	Compare the materials of construction for Battery and Electrochemical Sensors
	CO4	Explain the preparation, properties, and applications of Thermoplastics & Thermosetting & Elastomers Conducting Polymers
	CO5	Explain the principles of Spectrometry and Instrumental Techniques.
C103 LINEAR ALGEBRA & CALCULUS	CO1	Develop the matrix algebra techniques that are needed by engineers for practical applications.
	CO2	Utilize the mean value theorems to real life problems.
	CO3	Familiarize with functions of several variables which is useful in optimization.
	CO4	Learn important tools of calculus in higher dimensions.
	CO5	Familiarize with double and triple integrals of functions of several variables in to dimensions using Cartesian and polar coordinates and in three dimensions using cylindrical and spherical coordinates.

C104 PART A: BASIC CIVIL ENGINEERING	CO1	Understand various sub-divisions of Civil Engineering and to appreciate their role in ensuring better society.
	CO2	Know the concepts of surveying and to understand the measurement of distances, angles and levels through surveying.
	CO3	Realize the importance of Transportation in nation's economy and the engineering measures related to Transportation.
	CO4	Understand the importance of Water Storage and Conveyance Structures so that the social responsibilities of water conservation will be appreciated.
	CO5	Understand the basic characteristics of Civil Engineering Materials and attain knowledge on prefabricated technology.
C104 PART B: BASIC MECHANICAL ENGINEERING	CO1	Understand the different manufacturing processes.
	CO2	Explain the basics of thermal engineering and its applications.
	CO3	Describe the working of different mechanical power transmission systems and power plants.
	CO4	Describe the basics of robotics and its applications.
C105 INTRODUCTION TO PROGRAMMING	CO1	Apply the fundamentals of algorithms flowcharts and C-Program.
	CO2	Analyze a problem and develop an algorithm to solve it.
	CO3	Implement various algorithms using the C programming language.
	CO4	Develop C programs using pointer and its related concepts.
	CO5	Develop problem-solving skills and the ability to debug and optimize the code.
C106 COMMUNICATIVE ENGLISH LAB	CO1	Understand the different aspects of the English language proficiency with emphasis on LSRW skills.
	CO2	Apply communication skills through various language learning activities.
	CO3	Analyze the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking comprehension.
	CO4	Analyze and exhibit professionalism in participating in debates and group discussions.
	CO5	Produce effective Speaking

C107 CHEMISTRY LAB	CO1	Determine the cell constant and conductance of solutions.
	CO2	Prepare advanced polymer Bakelite materials.
	CO3	Measure the strength of an acid present in secondary batteries.
	CO4	Analyse the UV spectra of some organic compounds.
	CO5	Calculate strength of acid in Pb-Acid battery.
C108 ENGINEERING WORKSHOP	CO1	Identify workshop tools and their operational capabilities.
	CO2	Practice on manufacturing of components using workshop trades including fitting, carpentry, foundry and welding
	CO3	Apply fitting operations in various applications.
	CO4	Apply basic electrical engineering knowledge for House Wiring Practice.
C109 COMPUTER PROGRAMMING LAB	CO1	Apply C program concepts for execution.
	CO2	Apply the right control structure for solving the problem.
	CO3	Develop C programs which utilize memory efficiently using programming constructs like pointers.
	CO4	Develop programs to demonstrate the applications of arrays, functions, basic concepts of pointers in C.
C110 HEALTH & WELLNESS, YOGA & SPORTS	CO1	Understand the importance of yoga and sports for Physical fitness and sound health.
	CO2	Demonstrate an understanding of health-related fitness components.
	CO3	Compare and contrast various activities that help enhance their health.
	CO4	Assess current personal fitness levels.
	CO5	Develop Positive Personality
C111 ENGINEERING PHYSICS	CO1	Analyze the intensity variation of light due to polarization, interference and diffraction.
	CO2	Familiarize with the basics of crystals and their structures.
	CO3	Explain fundamentals of quantum mechanics and apply it to one dimensional motion of particles.
	CO4	Summarize various types of polarization of dielectrics and classify the magnetic materials.

	CO5	Explain the conductivity in semiconductor based on its band structure and Hall Effect.
C112 DIFFERENTIAL EQUATIONS & VECTOR CALCULUS	CO1	Importance of first order and first degree differential equations.
	CO2	Solve the Higher order differential equations related to various engineering fields.
	CO3	Identify solution methods for partial differential equations that model physical processes.
	CO4	Interpret the physical meaning of different operators such as gradient, curl and divergence.
	CO5	Estimate the work done against a field, circulation and flux using vector calculus & Importance of vector integral theorems
C113 BASIC ELECTRICAL AND ELECTRONICS	CO1	Describe fundamental laws, operating principles of motors/generators, MC/MI instruments
	CO2	Demonstrate the working of electrical machines, measuring instruments and power generation stations.
	CO3	Apply mathematical tools and fundamental concepts to derive various equations related to electrical circuits and machines.
	CO4	Understand the operation of PN junction diode and its application as a rectifier
	CO5	Understand the operation of transistor along with its characteristics and to analyse its application as amplifier
	CO6	Study the functionality of logic gates and apply it for the design of combinational and sequential circuits
C114 ENGINEERING GRAPHICS	CO1	Understand the principles of engineering drawing, including engineering curves, scales, orthographic and isometric projections.
	CO2	Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views.
	CO3	Understand and draw projection of solids in various positions in first quadrant.
	CO4	Explain principles behind development of surfaces.
	CO5	Prepare isometric and perspective sections of simple solids.

C115 IT WORKSHOP	CO1	Perform Hardware troubleshooting.
	CO2	Discuss the basic hardware components and their relationships among the components.
	CO3	Safeguard computer systems from viruses / worms.
	CO4	Document/Presentation preparation.
	CO5	Perform calculations using spreadsheets.
C116 DATA STRUCTURES	CO1	Apply the role of linear data structures in organizing and accessing data efficiently in algorithms.
	CO2	Design, implement, and apply linked lists for dynamic data storage, demonstrating understanding of memory allocation.
	CO3	Develop programs using stacks to handle recursive algorithms, manage program states, and solve related problems.
	CO4	Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between deques and priority queues, and apply them appropriately to solve data management challenges.
	CO5	Devise novel solutions to small scale programming challenges involving data structures such as stacks, queues, Trees.
	CO6	Recognize scenarios where hashing is advantageous, and design hash-based solutions for specific problems.
C117 ENGINEERING PHYSICS LAB	CO1	Operate optical instruments like travelling microscope and spectrometer.
	CO2	Estimate the wavelengths of different colours using diffraction grating.
	CO3	Plot the intensity of the magnetic field of circular coil carrying current with distance.
	CO4	Evaluate dielectric constant and magnetic susceptibility for dielectric and magnetic materials respectively.
	CO5	Identify the type of semiconductor using Hall effect and Calculate the band gap of a semiconductor.
C118 ELECTRICAL AND ELECTRONICS ENGINEERING WORKSHOP	CO1	Measure voltage, current and power in an electrical circuit
	CO2	Measure of Resistance using Wheat stone bridge (L4).
	CO3	Discover critical field resistance and critical speed of DC shunt generators.
	CO4	Investigate the effect of reactive power and power factor in electrical loads
	CO5	Identify & testing of various electronic components.
	CO6	Understand the usage of electronic measuring instruments.
	CO7	Plot and discuss the characteristics of various electron devices.

C119 DATA STRUCTURES LAB	CO1	Apply the role of linear data structures in organizing and accessing data efficiently in algorithms.
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	CO4	Apply queue-based algorithms for efficient task scheduling and breadth-first traversal in graphs and distinguish between deques and priority queues and apply them appropriately to solve data management challenges.
	CO5	Recognize scenarios where hashing is advantageous, and design hash-based solutions for specific problems.
C120 NSS / NCC / SCOUTS & GUIDES / COMMUNITY SERVICE	CO1	Understand the importance of discipline, character and service motto.
	CO2	Solve some societal issues by applying acquired knowledge, facts, and techniques.
	CO3	Explore human relationships by analyzing social problems.
	CO4	Determine to extend their help for the fellow beings and downtrodden people.
	CO5	Develop leadership skills and civic responsibilities.
C201 DISCRETE MATHEMATICS & GRAPH THEORY	CO1	Build skills in solving mathematical problems
	CO2	Comprehend mathematical principles and logic
	CO3	Demonstrate knowledge of mathematical modeling and proficiency in using mathematical software
	CO4	Manipulate and analyze data numerically and/or graphically using appropriate Software
	CO5	How to communicate effectively mathematical ideas/results verbally or in writing
C202 UNIVERSAL HUMAN VALUES – UNDERSTANDING HARMONY AND ETHICAL HUMAN CONDUCT	CO1	Define the terms like Natural Acceptance, Happiness and Prosperity
	CO2	Identify one's self, and one's surroundings (family, society nature)
	CO3	Apply what they have learns to their own self in different day-todaysettings in real life
	CO4	Relate human values with human relationship and human society.
	CO5	Justify the need for universal human values and harmonious existence

	CO6	Develop as socially and ecologically responsible engineers
C203 DIGITAL LOGIC & COMPUTER ORGANIZATION	CO1	Apply number systems, Boolean algebra, and simplification techniques for analyzing digital circuits.
	CO2	Design and implement combinational logic circuits to meet specified requirements.
	CO3	Construct sequential circuits such as counters, registers, and state machines.
	CO4	Explain processor organization, instruction formats, and control unit operation.
	CO5	Analyze memory hierarchy and input/output organization in computer systems.
C204 ADVANCED DATA STRUCTURES & ALGORITHM ANALYSIS	CO1	Apply advanced tree data structures for efficient searching, insertion, and deletion operations.
	CO2	Analyze and implement graph algorithms for shortest path, spanning trees, and network optimization.
	CO3	Utilize hashing techniques and advanced dictionaries for fast data access.
	CO4	Employ algorithm design paradigms (divide & conquer, greedy, DP, backtracking) to solve computational problems.
	CO5	Evaluate algorithm complexity, classify problems as P, NP, NP-Complete, and analyze approximation strategies.
C205 OBJECT ORIENTED PROGRAMMING THROUGH JAVA	CO1	Apply object-oriented principles (encapsulation, inheritance, polymorphism, abstraction) in Java program design.
	CO2	Implement robust applications using exception handling and multithreading concepts.
	CO3	Utilize Java packages, collection framework, and I/O streams for effective programming.
	CO4	Develop interactive GUI applications using Swing and event-driven programming.
	CO5	Integrate Java applications with databases using JDBC for real-world problem solving.
C206 ADVANCED DATA STRUCTURES AND ALGORITHMS ANALYSIS LAB	CO1	Implement advanced tree data structures and validate their operations
	CO2	Design and implement graph algorithms for real-world problem solving.
	CO3	Apply hashing techniques and advanced dictionary structures for efficient data access.
	CO4	Develop solutions to computational problems using algorithm design paradigms.

	CO5	Analyze algorithm performance experimentally and compare theoretical complexities.
C207 OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB	CO1	Develop and test Java programs applying OOP principles such as encapsulation, inheritance, and polymorphism.
	CO2	Implement programs with exception handling and multithreading for robust applications.
	CO3	Use collections, packages, and file I/O operations for structured programming.
	CO4	Design GUI-based applications with event-driven programming using Swing and Applets.
	CO5	Build real-time applications integrating Java programs with databases using JDBC.
C208 PYTHON PROGRAMMING	CO1	Apply basic programming constructs of Python to solve simple problems.
	CO2	Use Python data structures effectively for data manipulation and storage.
	CO3	Implement modular and reusable programs using functions, modules, and file handling.
	CO4	Apply object-oriented concepts in Python for real-world applications.
	CO5	Utilize Python libraries and tools (NumPy, Pandas, Matplotlib, DB connectivity) for problem solving and application development.
C209 ENVIRONMENTAL SCIENCE	CO1	Explain the structure and functions of ecosystems and importance of biodiversity.
	CO2	Identify sustainable management practices for natural resources.
	CO3	Analyze sources, impacts, and control measures of environmental pollution.
	CO4	Evaluate social issues related to the environment and suggest mitigation strategies.
	CO5	Assess the relationship between population, environment, and sustainable development.
C210 MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS	CO1	Understand the fundamentals of managerial economics and apply demand analysis techniques.
	CO2	Analyze production and cost concepts for managerial decision-making.
	CO3	Evaluate different market structures and apply appropriate pricing strategies.
	CO4	Interpret financial statements and apply accounting tools for business analysis.
	CO5	Apply capital budgeting and financial analysis techniques for investment decisions.

C211 PROBABILITY & STATISTICS	CO1	Apply the basic concepts of probability and random variables in solving engineering problems.
	CO2	Use standard probability distributions to model and analyze real-life phenomena.
	CO3	Demonstrate the concepts of sampling and estimation in statistical inference.
	CO4	Perform hypothesis testing for decision-making in engineering and research problems.
	CO5	Analyze data using correlation, regression, and curve fitting techniques for predictions.
C212 OPERATING SYSTEMS	CO1	Explain the structure, functions, and services of operating systems.
	CO2	Apply process management techniques including scheduling, synchronization, and deadlock handling.
	CO3	Demonstrate memory management strategies and apply virtual memory concepts.
	CO4	Analyze file system and storage management mechanisms for performance optimization.
	CO5	Evaluate modern OS case studies and apply OS concepts to emerging technologies like cloud and distributed systems.
C213 DATABASE MANAGEMENT SYSTEMS	CO1	Understand database concepts, models, and relational structures
	CO2	Formulate queries using relational algebra, calculus, and SQL.
	CO3	Apply normalization techniques for effective database design.
	CO4	Analyze transaction management, concurrency, and recovery mechanisms.
	CO5	Demonstrate indexing, storage structures, and explore advanced database technologies.
C214 SOFTWARE ENGINEERING	CO1	Explain software engineering principles, process models, and their applicability.
	CO2	Apply requirements engineering techniques to capture and document software needs.
	CO3	Develop software designs using architectural, behavioral, and structural modeling approaches.
	CO4	Apply software testing methods and quality assurance practices to ensure reliable software.
	CO5	Analyze project management strategies, risks, and modern software engineering practices.
C215 OPERATING SYSTEMS LAB	CO1	Implement process creation, scheduling, and inter-process communication mechanisms.
	CO2	Develop solutions for classical synchronization problems using semaphores and monitors.

	CO3	Simulate memory management techniques including paging, segmentation, and page replacement.
	CO4	Apply file management techniques and implement basic file operations.
	CO5	Demonstrate deadlock handling algorithms and explore real-time OS utilities through case studies.
C216 DATABASE MANAGEMENT SYSTEMS LAB	CO1	Apply SQL commands for creating, manipulating, and querying relational databases.
	CO2	Implement constraints, joins, and subqueries for relational data retrieval.
	CO3	Demonstrate normalization techniques and advanced SQL features for efficient database design.
	CO4	Develop PL/SQL programs using procedures, functions, cursors, and triggers.
	CO5	Apply transaction management concepts and design a mini-project using DBMS principles.
C217 FULL STACK DEVELOPMENT –I	CO1	Apply HTML, CSS, and JavaScript to design responsive and interactive web pages.
	CO2	Develop dynamic client-side applications using modern JavaScript features and frameworks.
	CO3	Build backend applications and RESTful APIs using Node.js/Express.js.
	CO4	Integrate databases with backend systems to implement full-stack functionality.
	CO5	Deploy full-stack applications on cloud platforms and demonstrate version control through Git.
C218 DESIGN THINKING & INNOVATION	CO1	Explain the principles, stages, and relevance of design thinking in innovation
	CO2	Apply empathy techniques to identify and frame real-world problems.
	CO3	Generate creative ideas and evaluate alternatives using ideation techniques.
	CO4	Develop prototypes and validate solutions through testing and iteration.
	CO5	Integrate design thinking into innovation and entrepreneurship practices.
C301 DATA WAREHOUSING AND DATA MINING	CO1	Explain the concepts and architecture of data warehousing.
	CO2	Design and implement a data warehouse schema.
	CO3	Apply data mining techniques such as association rule mining.
	CO4	Use classification and clustering algorithms on real-world datasets.

	CO5	Analyze and evaluate data mining results in various application domains.
C302 COMPUTER NETWORKS	CO1	Describe network models, protocols, and transmission media.
	CO2	Analyze data link layer functionalities and error detection methods.
	CO3	Explain and evaluate routing algorithms in the network layer.
	CO4	Understand flow control and congestion control mechanisms in transport layer.
	CO5	Apply knowledge of application protocols like HTTP, DNS, FTP in practical scenarios.
C303 FORMAL LANGUAGES AND AUTOMATA THEORY	CO1	Understand the concepts of automata theory and regular languages.
	CO2	Design regular expressions and finite automata for pattern recognition.
	CO3	Analyze context-free grammars and pushdown automata.
	CO4	Explore Turing machines and their computational capabilities.
	CO5	Explain decidability and complexity of computational problems.
C304 ARTIFICIAL INTELLIGENCE	CO1	Understand AI concepts and intelligent agent architectures.
	CO2	Solve problems using uninformed and informed search algorithms.
	CO3	Represent knowledge using predicate logic and semantic networks.
	CO4	Apply basic machine learning techniques.
	CO5	Evaluate real-world applications of AI in various domains.
C305 ENTREPRENEUR SHIP DEVELOPMENT& VENTURE CREATION	CO1	Understand the role and importance of entrepreneurship in the economy.
	CO2	Identify and analyze business opportunities.
	CO3	Prepare business plans and perform feasibility studies.
	CO4	Understand sources of funding and manage startup finances.
	CO5	Apply strategies for business growth and sustainability.
C306 DATA MINING LAB	CO1	Perform data preprocessing and cleaning tasks.
	CO2	Implement association rule mining techniques.

	CO3	Apply classification algorithms on datasets.
	CO4	Apply clustering algorithms for pattern discovery.
	CO5	Evaluate and interpret data mining results.
C307 COMPUTER NETWORKS LAB	CO1	Understand and configure basic network protocols.
	CO2	Develop simple socket-based client-server applications.
	CO3	Simulate network protocols and analyze behavior.
	CO4	Perform IP addressing and subnetting for networks.
	CO5	Use tools for packet analysis and troubleshooting.
C308 FULLSTACKDEVELOPMENT-2	CO1	Develop advanced frontend applications using frameworks
	CO2	Build and integrate backend services using RESTful APIs.
	CO3	Implement secure and scalable database operations.
	CO4	Deploy full stack applications using cloud/CI-CD tools.
	CO5	Work effectively in teams for agile development.
C309 USER INTERFACE DESIGN USING FLUTTER	CO1	Understand Dart programming and Flutter framework.
	CO2	Design user interfaces using Flutter widgets.
	CO3	Apply state management techniques.
	CO4	Integrate APIs and implement navigation.
	CO5	Deploy and test mobile applications
C310 EVALUATION OF COMMUNITY SERVICE INTERNSHIP	CO1	Understand societal issues through community engagement.
	CO2	Apply technical knowledge to solve real-world problems.
	CO3	Demonstrate leadership and teamwork in fieldwork.
	CO4	Prepare and present detailed reports.
	CO5	Reflect on social responsibility and ethical impact.

Co-coordinator **HOD** **Principal**