Department of Computer Application		
MCA: I Semester		
S.No.	Course Code	Course Outcomes
1	CAT-004	1.Utilize principles of functions and algebraic structures to solve complex mathematical problems and enhancing computational and logical reasoning skills. 2. Apply concepts of posets, lattices, combinatorics, and graph theory to analyze and solve complex problems in discrete mathematics. 3. Apply the tree algorithms to simplify shorted path problems. 4. Analyze and evaluate graph structures, tree properties, and network flow algorithms to derive optimal solutions for complex graph applications in computer science. 5. Use of K-maps and truth tables to construct and verify correctness of a Boolean expression.
2	CAT-005	1. Investigate and Apply the given database models & techniques to create an effective schema for the real-world problem. 2. Apply generalization, aggregation, and reduction techniques to transform ER diagrams into relational tables. 3. Design and implement advanced SQL solutions by creating complex queries, PL/SQL programs to solve real-world database problems while ensuring data integrity and efficiency. 4. Analyze functional dependencies and apply normalization techniques to design efficient, well-structured databases that match industry standard. 5.Analyse and implement transaction processing, concurrency control and database recovery protocols in databases.
3	CAT-006	1.Identify and describe fundamental concepts of operating systems, including process management, memory management, file systems, and I/O systems. 2. Apply algorithms for process scheduling and demonstrate their performance in different scenarios. 3. Analyze virtual memory management techniques for effectively managing the execution of process. 4. Evaluate deadlock prevention, avoidance, and detection strategies and propose solutions to resolve deadlocks. 5.Design and develop a basic operating system module that incorporates process scheduling, synchronization, memory management, and file system organization.
4	CAT-007	1. Demonstrate foundational understanding of digital system design, data representation and computer system organization. 2. Apply digital logic and computer organization principles to design optimized hardware solutions that enhance computer system performance. 3. Analyze the functionality of given combinational and sequential circuit designs to determine the most effective configurations for specific applications. 4. Analyze the structure and functionality of computer organization and architecture to evaluate the impact of given components on system performance. 5. Evaluate different data transfer modes between the CPU and I/O devices and examine the interconnection structures of multiprocessors.

5	**AHT- 303**	1.Apply the technical skills to design a well-structured report for a given problem statement. 2. Develop an effective communication skill to present the idea to the team members or assessor. 3. Select the appropriate communication technology to create useful content on social media platforms. 4. Identify the effective listening and visual approach that promotes the competencies of public speaking. 5. Develop knowledge of grammar rules that enhance understanding of writing letters, research papers, proposals, and theses.
6	**CAT-008**	1. Identify appropriate data types to solve the given problem. 2. Apply OOP's principles and functions to develop structured programs. 3. Implement and analyze basic searching and sorting algorithms to efficiently retrieve and organize data in Python. 4. implement real-world applications using OOPs with file handling and exception handling techniques. 5. Design a GUI-based Python application using Tkinter and Turtle.
7	**CAP-001**	1. Design and implement a database schema for a given problem-domain. 2. Design and implement robust database applications by applying PL/SQL Tools with incorporating exception handling that ensure efficient and error free database operations. 3. Apply database management techniques to efficiently create, manipulate the database table for a given scenario. 4. Implement the database-driven applications with incorporating the SDG Goal for real-world systems using DBMS Morden tools. 5. Demonstrate professional ethics and project management skills by creating well-structured and comprehensive Laboratory reports.
8	**CAP-002**	1. Understand and apply the basic commands and utilities in Linux/UNIX systems to navigate the file system. 2. Implement and analyze the process scheduling algorithms. 3. Apply Linux/UNIX system calls and analyze the usage of important library functions to interact with the operating system. 4. Apply the UNIX-Shell Scripts and AWK to efficiently customized and automate the user works environment. 5. Apply the Linux/UNIX administrative commands to manage and control the work environment of the organization.
9	**CAP-003**	1. Understand the behavior of logic gates and digital circuits through hands on experiment on bread board. 2. Implement and test adders and subtractors in the lab. 3. Analyze ripple counters and registers through hands-on testing. 4. Design and build decoder and encoder circuits on a breadboard. 5. Prepare an effective laboratory record by following professional ethics.

10	**AHP-303**	1. Apply the technical skill to effective design and a well structure report for a given problem. 2. Develop effective communication skills to present the idea among the team members. 3. Select the appropriate communication technology to create useful contents on social media platforms. 4. Identify the effective listening and visual approach that promote the competencies of public speaking. 5. Create knowledge about grammar rules that promote understanding about writing letters, research papers, proposals, and thesis.

S.No	**Course Code**	**Course Outcome**
1	**CAT-009**	**1:** Apply numerical methods to solve algebraic and transcendental equations and demonstrate an understanding of error analysis. **2:** Implement interpolation techniques for approximating functions and analyzing data trends. **3:** Develop and apply numerical differentiation and integration methods to solve engineering and scientific problems. 4.Apply statistical techniques and hypothesis testing to interpret and analyze real-world data. **5:** Analyze and solve ordinary differential equations using numerical methods and predictor-corrector techniques.
2	**CAT-010**	1. Implement the ADT operations on the given data structure 2. Select appropriate data structures to optimize the solution of given problem definition. 3. Apply appropriate searching and sorting technique for given problem. 4. Design the advance data structure using Non-Linear data structure to solve real world problem. 5. Evaluate and Analyze the efficiency of a given algorithms.
3	**CAT-011**	1. Apply Object Oriented Programming principles of encapsulation, inheritance and polymorphism to design modular and reusable program. 2. Develop solution for a given problem using user define data types and exception handling. 3. Identify and Evaluate the essential components of Java's Remote Method Invocation (RMI) and describe their roles in enabling remote communication between distributed applications. 4. Design the GUI based applications using AWT and Swings. 5. Integrate databases with Java applications using JDBC for seamless data connectivity and efficient data management.

4	**CAT-012**	1. Understand and analyze the basics of computer networks, network architecture using OSI and TCP/IP reference models. 2. Identify various transmission techniques and apply them to solve problems in data communication. 3. Apply data link layer protocols for error detection and correction using IEEE 802 standards. 4. Analyze the performance of data transmission protocol in real world data transmission applications. 5. Evaluate and manage network security risks using session layer protocols.
5	**CAT-013**	1.Apply principles of production systems and advanced logical reasoning techniques to address the problem-solving scenarios in AI applications. 2. Apply and analyze probabilistic and fuzzy techniques to handle imprecision and uncertainty in decision making scenarios for medical diagnosis problem. 3. Develop intelligent algorithms for constraint satisfaction problems and intelligent systems for Game Playing. 4. Analyze logical reasoning through propositional and predicate logic, employing theorem proving techniques. 5.Design a machine learning model to solve real world prediction and classification problems using appropriate AI algorithm and modern tools.
6	**AHT -304**	1.Apply accounting techniques to record, classify, and summarize financial transactions systematically. 2. Analyze financial statements to assess the financial health and performance of an organization. 3. Demonstrate the ability to prepare budgets and use them as tools for financial planning and control. 4. Evaluate investment decisions using financial tools and techniques, such as Net Present Value (NPV) and Internal Rate of Return (IRR). 5. Apply cost accounting methods to determine product costs and support managerial decision-making.
7	**CAP-004**	1. Apply mathematical techniques of sorting and searching algorithms for solving a given problem. 2. Implement linear and nonlinear data structures for a given application domain using c programming languages. 3. Design algorithms for given applications using non-linear data structures. 4. Analyze the result in terms of time and space complexity for given algorithms. 5. Document lab work comprehensively by applying professional ethics.
8	**CAP-005**	1.Utilize OOP fundamentals of inheritance, polymorphism, and abstraction to create scalable and maintainable Java applications 2. Analyze and optimize Java algorithms for sorting, searching, and solving the mathematical matrix operations and quadratic equations problems. 3. Implement a basic client-server application using Remote Method Invocation (RMI) to facilitate remote communication between Java applications. 4. Design visually appealing and user-friendly GUI applications using Swing/AWT, ensuring seamless interaction through event handling. 5. Apply comprehensive exception handling techniques to implement input validating robust application.

9	**CAP-006**	1.Identify and understand fundamental network commands and tools used to diagnose network connectivity and performance issues. 2. Configure and implement basic network setups, including IP addressing, sub netting, and setting up routers and switches in a simulated or real environment. 3. Analyze different routing algorithms and protocols to manage data flow in networks. 4. Implement the network topologies using tools and evaluate network performance metrics. 5. Prepare the laboratories report including analysis and impact of IEEE standards.
10	**CAP-007**	1. Implement the interactive communication application using python libraries. 2. Apply the AI base heuristic search algorithms to optimize the solution of a given real-world problems. 3. Develop and implement interactive intelligent game applications using artificial intelligence logic and Python libraries as a team member. 4. Apply and investigate natural language processing techniques to clean and preprocess text, making it suitable for AI processing while adhering the ethical guidelines of privacy. 5. Implement and evaluate the naive Bayesian classifier on a sample training dataset, assessing its accuracy across multiple test dataset.
S.No	**Course Code**	**Course Outcome**
1	**CAT-014**	1. Understand and apply the basic mathematical terminology to represent the graph and subgraph. 2. Analyze the connectivity, separability, and planarity of graphs by applying Euler's formula and Krakowski's theorem. 3. Select the Graph/Tree algorithm to optimize the shortest path for a given network problem. 4. Apply the graph to solve the real-world problem in the domain of circuit designing and network constructions. 5. Apply and analyze the graph coloring and partitioning techniques to find the distinct path for real world path covering problem.
2	**CAT-015**	1. Identify and apply appropriate software architectures models and patterns to carry out high level design of a system. 2.Summarize and evaluate software requirement specifications (SRS) and related documentation. 3.Select the software testing strategies and validate software applications to ensure functionality, reliability, and performance. 4.Design and architect software systems that meet specified requirements using industry-standard modern engineering practices. 5. Apply the project management techniques and analyze the models for cost estimation and resource utilizations.

3	**CAT-18**	1. Apply state-of-the-art IoT architectural models and reference architectures to design IoT solutions for industrial and consumer applications. 2. Examine the role of IoT with Big Data and Serialization for value creation in manufacturing, retail, oil, gas industries and healthcare. 3. Analyze M2M and IoT value chains and assess the architectural design principles and standards for IoT implementation. 4. Implement basic IoT applications on embedded platform using modern tools 5. Identify the privacy, security, and governance challenges in IoT data platforms for Smart Cities and propose strategies for building secure IoT environments.
4	**POM**	1. Understanding & Evaluate the application of different management theories in real-world organizational settings. 2. Apply MIS in practical organizational scenarios to enhance decision-making effectiveness. 2. Examine the relationship between organizations and their external environments. 3. Implement these concepts to improve organizational efficiency and employee satisfaction. 4. Apply Japanese management techniques through case studies, focusing on control, coordination, and motivation.
5	**AHT**	1. Apply the significance of Universal Human Values in aspects of life and society. 2. Examine the innate desires and goals common to all people while considering the societal, environment and economic context. 3. Determine the strategies to promote and integrate Universal Human Values in Personals and professional life. 4 Analyze harmony in nature and existence and work out their mutually fulfilling participation in the nature. 5. Create a compressive view on implication of adopting a holistic view on ethical human conduct
6	**CAP-008**	1. Apply basic concepts of UML, test cases and OOP concepts to effectively design the prototype model for a given problem using UML development Tools. 2. Develop software requirements specifications for a given problem/Software using IEE SRS standard. 3. Select the modern tool to test and validate the given case study software and analyze the result. 4. Apply the software testing techniques to ensure software functionality and quality. 5. Analyze the given software models for cost estimation and resource utilizations using project management techniques.
7	**CAP-009**	1. Develop and present well-researched arguments and analysis on given problem while following professional ethics. 2. Collaborate effectively in group discussions, offering constructive feedback and building on the ideas of others to foster a collaborative learning environment. 3. Apply theoretical knowledge to real-world problems by analyzing case studies, research papers and industry developments relevant to selected seminar topics. 4. Investigate the industrial and societal problems and reach to concrete possible solutions using modern computational Tools. 5. Apply the professional ethics and project management skills to write well-structured report and present effectively as an individual or a team member.

8	**CAP-010**	1.Identify and Define a problem/challenge for managing risks and opportunities related to environmental, social, and governance criteria. 2. Analyze industrial and societal challenges and develop effective solutions using modern software tools. 3. Apply project management principles to the planning and execution of a small project using modern tools and techniques. 4. Collaborate effectively within a team, demonstrating the ability to communicate ideas, delegate tasks, and resolve conflicts. 5.Demonstrate professional ethics and project management skills to produce well-structured reports and deliver effective presentations, both individually and as part of a team.
S.No	**Course Code**	**Course Outcomes**
1	**CAT-022**	1. Apply modular arithmetic, Advanced Encryption Standard (AES) and finite field concepts to perform encryption and decryption. 2. Identify prime and relative prime numbers and apply these concepts to generate cryptographic keys and algorithms. 3. Design and develop security architectures that incorporate Secure Socket Layer (SSL) and Secure Electronic Transaction (SET) protocols to safeguard online transactions. 4. Select appropriate security tools and technologies for protecting network assets. 5. Analyze and Research emerging network security threats and trends, adapting security strategies to mitigate new risks.
2	**AHT 412**	1. Identify and evaluate the promotional schemes and rules for establishment of new micro, small, and medium enterprises (MSMEs). 2. Apply key concepts of project resource planning to effectively plan and optimize new enterprise setups. 3. Formulate a project proposal incorporating marketing strategies, financial management, and business planning through market surveys and cost-volume-profit analysis. 4. Analyze the successes and failures of entrepreneurs and self-employed individuals to draw and integrate positive conclusions. 5. Assess risks associated with entrepreneurship using decision-making strategies and risk management methods.

3	**CAT-027**	1. Apply and analyze the mathematical fundamentals to manage the data sets in supervised and unsupervised learning. 2. Apply decision tree learning and artificial neural networks. 3. Design and Implement Convolutional and Recurrent Neural Networks. 4. Apply Bayesian learning using bayes theorem, naive bayes classifier and EM Algorithm. 5. Design and evaluate real world models using natural language and machine learning techniques.
4	**CAT-028**	1. Develop an appropriate plan for software quality management and its significance in software development. 2.Apply the principles of software quality engineering and software testing techniques to assess and improve the effectiveness and efficiency of software development processes. 3. Examine appropriate international standard for real life software project for controlling and managing the quality of product. 4. Apply the software management principles and techniques to solve software quality challenges. 5. Apply and identify software testing tools to ensure functionality, reliability, and performance of given application software.
5	**CAP-011**	1. Apply the given security protocols to secure network communications and protect data integrity. 2. Analyze captured network traffic to identify potential security threats and assess the effectiveness of existing security measures. 3. Develop comprehensive security policies and procedures tailored to specific organizational needs, addressing risk management and compliance requirements. 4. Develop or customize network security tools and scripts for monitoring, scanning, and protecting network environments. 5. Work effectively in teams to design and develop comprehensive network security solutions, demonstrating project management and collaborative skills.
7	**CAP-013**	1. Identify and Define a problem for managing risks and opportunities related to environmental, social, and governance criteria and incorporate the SDG goals. 2. Implement the identify methods and techniques required for the project work and manage to work as an individual or a team member. 3. Formulate and implement the innovative ideas using project management techniques while ensuring SDG goals. 4. Analyze the results with cost estimation, resource utilizations and specified standard to come out with concrete solutions. 5. Apply the professional ethics to present and document project work comprehensively with detail methodologies and result as an individual or with team members.

8	**CAT- 016**	1. Understand the fundamental concepts of Big Data and the challenges of managing large-scale data sets. 2. Identify and Apply Big Data tools for storage, processing and analysis of large datasets. 3. Apply various data analytics techniques to extract insights from large datasets. 4. Analyze different storage models and processing frameworks for managing huge database. 5.Evaluate and analyze data visualization techniques and tools for interpreting and visualizing data in decision-making scenarios.