Program Outcomes for MCA

PO 1: Apply knowledge of computing fundamentals, mathematics and domain specific knowledge for modelling, designing and developing the solution from defined problems and requirements. **(Computational Knowledge)**

PO 2: Solve complex computing problems and provide authenticated solutions, using conclusion fundamental principles of mathematics, computing, and domain specific disciplines by exploring relevant literature. **(Problem Analysis)**

PO 3: Identify, Analyse, Design and Evaluate a computer-based system, components and process to meet the specific needs of applications, as well as the computing requirements considering public health and safety, cultural, societal, and environmental concerns. **(Design / Development of Solutions)**

PO 4: Investigate research techniques for developing effective solutions by systematic analysis of data for getting valid conclusions. **(Conduct Investigations of Complex Computing Problems)**

PO 5: Design, analyse and develop the computing systems using modern tools by considering the limitations. **(Modern Tool Usage)**

PO 6: Adapt to provide ethical solutions, within the boundaries and responsibilities of professional computing practices and cyber regulations. **(Professional Ethics)**

PO 7: Understand the need, for and have the preparation to absorb in independent and long-term learning in context to technological updates. **(Life-long Learning)**

PO 8: Demonstrate knowledge to considerate the computing and management principles and apply them to own establishment, to function effectively as an individual and as a member or leader in diverse teams in multidisciplinary environment. **(Project management and finance)**

PO 9: Communicate effectively on computing activities with the computing community, and with society at large and present effectively by writing and designing effective reports and design documentation, make effective presentations, and give and understand clear instructions. **(Communication Efficacy)**

PO 10: Demonstrate as an individual and as a member or as a leader in diverse team and in multidisciplinary environments for effective solutions. **(Individual and Team Work)**

PO 11: Demonstrate knowledge by applying innovation skills and initiating significant and prosperous opportunities for the progress of individual and society at large. **(Innovation and Entrepreneurship)**

Program Specific Outcomes (PSOs):

PSO 1: Globally expertise the technological planning and development of software applications in the usage of the modern era.

PSO 2: Expertise to communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare.

PSO 3: Ability to enhance and develop techniques for independent and lifelong learning in computer application.

PSO 4: Acquiring In-depth knowledge & sustained learning leading to innovation, permutation, modernization and research to fulfil global interest.

Course Outcomes:

MCA 1001: Fundamental of Computers & Emerging Technologies

CO 1: Bridge the fundamental concepts of computer with the present level knowledge of the students.

CO 2: Familiarise operating systems, programming languages, peripheral devices, networking, multimedia and internet.

CO 3: Explain the working of important application software and their use to perform any engineering activity.

CO 4: Identify major areas where technologies can be applied and their implications for organizational change.

CO 5: Recognize current and emerging disruptive technologies and their potential to impact social conditions, the economy, and daily life.

CO 6: Compare and contrast current and emerging technologies and their implications for social ethics and the global workplace.

CO 7: Appreciate the unique characteristics of and differences between disruptive technologies and their impacts.

CO 8: Recognize the importance of ethical practices with new technologies.

MCA 1002: Principles of Programming using C

CO 1: Understanding a functional hierarchical code organization.

CO 2: Ability to define and manage data structures based on problem subject domain.

CO 3: Ability to work with textual information, characters and strings.

CO 4: Ability to work with arrays of complex objects.

CO 5: Understanding a concept of object thinking within the framework of functional model.

CO 6: Understanding a concept of functional hierarchical code organization.

CO 7: Understanding a defensive programming concept. Ability to handle possible errors during program execution.

MCA 1003: Principles of Management & Communication

CO 1: Describe primary features, processes and principles of management.

CO 2: Explain functions of management in terms of planning, decision making and organizing.

CO 3: Illustrate key factors of leadership skills in directing and controlling business resources and processes.

CO 4: Exhibit adequate verbal and non-verbal communication skills.

CO 5: Demonstrate effective discussions, presentations and writing skills.

CO 6: To promote group interactions through class discussions.

MCA 1004: Discrete Mathematics

CO 1: To understand the concepts associated with Mathematical Logic and Predicate calculus.

CO 2: Ability to learn the basic concepts about relations, functions and to draw different diagrams like Lattice, Hasse diagrams.

CO 3: To understand the concepts of Algebraic Structures and combinatorics.

CO 4: To describe various types of recurrence relations and the methods to find out their solutions.

CO 5: To understand the basic concepts associated with Graphs and Trees.

MCA 1005: Computer Organization & Architecture

CO 1: Understand the organization of a Computer system.

CO 2: Explain the concept of stored program, role of operating system, Instruction sets and Addressing modes and Demonstrate problems on Addressing modes

CO 3: Demonstrate computer architecture concepts related to design of modern processors, memories and I/Os Develops an Entity-Relationship model based on user requirements.

CO 4: Analyze the performance of commercially available computers.

CO 5: To develop logic for assembly language programming.

MCA 2001: Theory of Automata & Formal Language

CO 1: Acquire a fundamental understanding of the core concepts in automata theory and formal languages.
CO 2: Ability to design grammars and automata (recognizers) for different language classes.
CO 3: Ability to identify formal language classes and prove language membership properties.
CO 4: Ability to prove and disprove theorems establishing key properties of formal languages and automata.
CO 5: Acquire a fundamental understanding of core concepts relating to the theory of computation and computational models including (but not limited to) decidability and intractability.

MCA 2002: Object Oriented Programming

CO 1: Write, compile, run, and test simple object-oriented Java programs demonstrating use of good object-oriented design principles including encapsulation and information hiding; primitive and reference data types.
CO 2: Understand and apply in programs the concept of inheritance, package and multithreading. Identify and fix common exception issues in code. Generic programming.
CO 3: Demonstrate the use of a variety of basic AWT components; file-based I/O; and one-dimensional arrays.
CO 4: Understand the concept of events and how to handle the event-driven programming and also networking. Develop JDBC application of elementary level.

MCA 2003: Operating System

CO 1: Understand the fundamental concepts of operating systems and their structure, processes, and threads.
CO 2: Able to solve questions based on algorithms for process scheduling for a given specification of CPU utilization, throughput, turnaround time, waiting time, and response time.
CO 3: Understand and analyze the memory management techniques.
CO 4: Apply page replacement algorithms to resolve the issues in virtual memory.
CO 5: Acquire knowledge of files and I/O management system.

MCA 2004: Database Management Systems

CO 1: Will be able to comprehend and evaluate the role of database management systems in information technology applications within organizations.
CO 2: Effectively explains the basic concepts of databases and data models.
CO 3: Develops an Entity-Relationship model based on user requirements.

CO 4: Designs SQL queries to create database tables and make structural modifications.
CO 4: Constructs queries with relational algebra.
CO 5: Explains the concurrency control and recovery algorithms.

MCA 2005: Data Structures & Analysis of Algorithms

CO1: Design correct programs to solve problems.
CO 2: Choose efficient data structures and apply them to solve problems.
CO 3: Analyze the efficiency of programs based on time complexity.
CO 4: Prove the correctness of a program using loop in-variants, pre-conditions and post-conditions in programs.
CO 5: Implement abstract data types using arrays and linked list.
CO 6: Apply the different linear data structures like stack and queue to various computing problems.
CO 7: Implement different types of trees and apply them to problem solutions.
CO 8: Analyze the various sorting and searching algorithms.

MCA 3001: Computer Networks

CO 1: Understand and explore the basics of Computer Networks and various protocols.
CO 2: Demonstrate the TCP/IP and OSI fashions with merits and demerits.
CO 3: Understand data, signals, and transmission media.
CO 4: Evaluate the performance of the channel.
CO 5: Analyse various transmission media, data encoding, modulation, and multiplexing techniques.
CO 6: Represent various data encoding and modulation techniques.
CO 7: Identify the errors using source and coding methods.
CO 8: Evaluating various Routing algorithms.
CO 9: Acquire knowledge of files and I/O management system.

MCA 3002: Artificial Intelligence

CO 1: Understanding of the historical evolution of Artificial Intelligence. Identification of the characteristics of an intelligent system/agent
CO 2: Identify the type of search strategy (heuristic) that is more appropriate to address a particular problem and implement the selected strategy. Design appropriate heuristics for a particular problem. Formalize and implement constraints in search problems
CO 3: Formalization of knowledge using the framework of predicate logic. Automatic reasoning in predicate logic using inference rules. Implementation of these reasoning systems using either backward or forward inference mechanisms. General problem solving using logic programming (Prolog)

CO 4: Identify the type of learning process (supervised, unsupervised, reinforcement learning) is more appropriate to address a given problem. Extract conclusions from uncertain knowledge and quantify the uncertainty in the conclusions obtained.

MCA 3003: Software Engineering

CO 1: Acquire strong fundamental knowledge in science, mathematics, fundamentals of computer science, software engineering and multidisciplinary engineering to begin in practice as a software engineer.

CO 2: Design applicable solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal and economic concerns.

CO 3: Deliver quality software products by possessing the leadership skills as an individual or contributing to the team development and demonstrating effective and modern working strategies by applying both communication and negotiation management skill.

CO 4: Apply new software models, techniques and technologies to bring out innovative and novelistic solutions for the growth of the society in all aspects and evolving into their continuous professional development.

Electives – I

Cryptography & Network Security (11)

CO 1: Provide security of the data over the network.

CO 2: Do research in the emerging areas of cryptography and network security.

CO 3: Implement various networking protocols.

CO 4: Protect any network from the threats in the world.

Data Warehousing & Data Mining (12)

CO 1: Get Knowledge of data pre-processing and data quality modeling and design of data-warehouse algorithms for data mining.

CO 2: Able to design data warehouses.

CO 3: Ability to apply acquired knowledge for understanding data and select suitable methods for data analysis.

Software Project Management (13)

CO 1: Identify the different project contexts and suggest an appropriate management strategy.
CO 2: Practice the role of professional ethics in successful software development.
CO 3: Identify and describe the key phases of project management.
CO 4: Determine an appropriate project management approach through an evaluation of the business context and scope of the project.

Cloud Computing (14)

CO 1: To understand the basic concepts Cloud Computing & its Services.
CO 2: To understand the taxonomy and types of Cloud Computing.
CO 3: To understand different hypervisors of Clouds for the Virtualization.
CO 4: To understand how to secure the Cloud & how to Demystify the Cloud.

Electives - II

Web-Technologies (21)

CO 1: Analyze given assignment to select sustainable web development and design methodology.
CO2: Develop web based application using suitable client side and server side web technologies.
CO 3: Develop solution to complex problems using appropriate method, technologies, frameworks, web services and content management.

Big Data (22)

CO 1: Model and implement efficient big data solutions for various application areas using appropriately selected algorithms and data structures.
CO 2: Analyze methods and algorithms, to compare and evaluate them with respect to time and space requirements.
CO 3: To make appropriate design choices when solving real-world problems.
CO 4: Apply non-relational databases, the techniques for storing and processing large volumes of structured and unstructured data, as well as streaming data.

Software Testing & Quality Assurance (23)

CO1: Students learn to apply software testing knowledge and engineering methods.
CO 2: Students understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.

CO 3: Students analyze and understand the use of software testing methods and modern software testing tools for their testing projects.
CO 4: Students identify defects and manage those defects for improvement in quality for given Software.
CO 5: Students learn to design SQA activities, SQA strategy, formal technical review report for software quality control and assurance.

Digital Image Processing (24)

CO 1: Understand image representation.
CO 2: Enhance image quality using image enhancement techniques.
CO 3: Filter given image using frequency domain filtering technique.
CO 4: Categorize various compression techniques.
CO 5: Represent image using a minimum number of bits using image compression.
CO 6: Understand the image segmentation technique.
CO 7: Do morphological operations on the given image.

Electives – III

Privacy & Security in Online Social Media (31)

CO 1: Appreciate various privacy and security concerns (spam, phishing, fraud nodes, identity theft) on Online Social Media.
CO 2: Articulate various concerns comprehensively on Online Social Media.
CO 3: Evaluate basic functionalities of trust, credibility and reputations in social media.

Soft Computing (32)

CO1: To know the basics of soft computing techniques and also their use in some real life situations.
CO 2: To learn the key aspects of Soft computing.
CO 3: To understand the features of neural network and its applications.
CO 4: To learn the key aspects of Fuzzy Systems.

Pattern Recognition (33)

CO 1: Apply the fundamental concepts related to pattern analysis, feature extraction and visual geometric modelling.

CO 2: Analyse and interpret the parametric and non – parametric estimation.

CO 3: Contribute to research and further developments in the field of pattern recognition and computer vision applications ranging from biometrics, medical diagnosis, document processing, mining of visual content, to surveillance, advanced rendering etc.

Software Quality Engineering (34)

CO 1: Relate software quality attributes with respect to cost due to defects in software

CO2: Understand how to do formal inspection, record and evaluate the results of inspection

CO3: Apply quality tools and techniques in their projects

CO4: Establish software development with quality plan

CO5: Explain about software verification, validation and testing.

Compiler Design (35)

CO 1: Explain the concepts and different phases of compilation with compile time error handling.

CO 2: Represent language tokens using regular expressions, context free grammar and finite automata and design lexical analyzer for a language.

CO 3: Compare top down with bottom up parsers, and develop appropriate parser to produce parse tree representation of the input.

CO 4: Generate intermediate code for statements in high level language.

CO 5: Design syntax directed translation schemes for a given context free grammar.

CO 6: Apply optimization techniques to intermediate code and generate machine code for high level language program.

Electives - IV

Block chain Architecture (41)

CO 1: Understand and explore the working of Block-chain technology.

CO 2: Analyze the working of Smart Contracts.

CO 3: Apply the learning of solidity and de-centralized apps on Ethereum.

CO 4: Explore various aspects of Block-chain technology.

Neural Network (42)

CO1: Model Neuron and Neural Network, and to analyze ANN learning, and its applications.
CO2: Perform Pattern Recognition, Linear classification.
CO3: Develop different single layer/multiple layer Perception learning algorithms
CO4: Design of another class of layered networks

Internet of Things (43)

CO1: Able to understand the application areas of IOT
CO2: Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks ·
CO3: Able to understand building blocks of Internet of Things and characteristics.

Wireless and Mobile Computing (44)

CO 1: Explain the basics of wireless communication systems.
CO 2: Demonstrate the concepts of wireless communication networks.
CO 3: Analyse small scale Fading & Multipath.
CO 4: Develop and demonstrate various routing protocols.
CO 5: Evaluate the quantization techniques in speech coding.

Computer Vision (45)

CO1: Identify basic concepts, terminology, theories, models and methods in the field of computer vision.
CO2: Describe known principles of human visual system.
CO3: Describe basic methods of computer vision related to multi-scale representation, edge detection and detection of other primitives, stereo, motion and object recognition
CO4: Suggest a design of a computer vision system for a specific problem.

Electives – V

Mobile Computing (51)

CO 1: Explain the basics of mobile Computing.
CO 2: Describe the functionality of Mobile IP and Transport Layer.
CO 3: Classify different types of mobile telecommunication systems.

CO 4: Demonstrate the Adhoc networks concepts and its routing protocols.
CO 5: Make use of mobile operating systems in developing mobile application.

Computer Graphics and Animation (52)

CO 1: Explain the core concepts of computer graphics systems and analyze the output primitive algorithms.
CO 2: Describe various types of attributes of output primitives, Structure concepts and Interactive Input methods.
CO 3: Evaluate various techniques for performing 2D transformations and viewing techniques.
CO 4: Analyse 3D Object representations, 3D transformations and curve generation methods.
CO 5: Demonstrate visible surface detection methods and computer animation.

Natural Language Processing (53)

CO1: This course introduces the fundamental concepts and techniques of natural language processing (NLP).
CO 2: Students will gain an in-depth understanding of the computational properties of natural languages and the commonly used algorithms for processing linguistic information.
CO 3: The course examines NLP models and algorithms using both the traditional symbolic and the more recent statistical approaches.

Machine Learning (54)

CO1: Develop an appreciation for what is involved in learning models from data.
CO2: Understand a wide variety of learning algorithms.
CO3: Understand how to evaluate models generated from data.
CO4: Apply the algorithms to a real problem, optimize the models learned and report on the expected accuracy that can be achieved by applying the models.

Quantum Computing (55)

CO1: The basic principles of quantum computing.
CO 2: The fundamental differences between conventional computing and quantum computing.
CO 3: Knowledge of several basic quantum computing algorithms.
CO 4: The classes of problems that can be expected to be solved well by quantum computers.