

Master of Computer Applications

Programme Outcomes:

- The knowledge of mathematics and computing fundamentals to apply on various real life applications for any given requirement.
- Skills to analyze a problem along with identify and define the logical modelling of solutions.
- Ability to design, implement and evaluate a computer-based system, process, component to meet stakeholder needs.
- Integrate and apply efficiently the contemporary IT tools to all computer applications.
- Analyze and review literature to invoke the research skills to design, interpret and make inferences from the resulting data.
- Function effectively both as a team leader and team member on multi disciplinary projects to express computing and management skills.
- Apply the intrinsic skills with complete focus to function as a successful entrepreneur.
- Communicate effectively and present technical information.
- Apply ethical principles and commit to professional ethics and responsibilities.
- Have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Programme Specific Outcomes:

- The students can select the suitable data model, appropriate architecture and platform to implement a system with good performance.
- The students can design and integrate various system based components to provide user interactive solutions for various challenges.

MCA I SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 1.1: DISCRETE MATHEMATICAL STRUCTURES

Course Outcomes

- Knowledge on various Mathematical proofs using Mathematical Logic of Statement calculus and Predicate calculus, and machine learning process through algebraic structures and its homomorphism.
- Skilled in algorithm approach of problem solving method through Grammars and Languages and aware of computer programming skill in a formal mathematical manner using recurrence relations and Advanced Techniques.
- Acquire knowledge on basic counting techniques to solve combinatorial problems as well as on Data Structures concepts.
- Awareness on Machine internal operations through lattice theory and Boolean algebra, and also on modeling the problem through graph theory.

MCA I SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 1.2: PROBABILITY AND STATISTICS

Course Outcomes

- Understand the elementary probability theory and its application along with the laws of probability.
- Awareness on the concept of the various statistical distributions along with the correlation and regression Analysis.
- Acquire Knowledge on the characteristics of the population and samples through large sample tests of significance.
- Classify any data through small sample tests of significance.

MCA I SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 1.3: SYSTEMS APPROACH TO MANAGEMENT

Course Outcomes

- Practice the process of management's four functions: planning, organizing, leading, and controlling for developing the computerized system.
- Gather and analyze both qualitative and quantitative information to isolate issues and formulate best control methods.
- Identify and evaluate social responsibility and ethical issues involved in business situations and logically articulate own position on such issues.
- Evaluate the global context for taking managerial actions of planning, organizing and controlling in terms of developing the system.
- Assess global situation, including opportunities and threats that will impact management of an organization.
- Integrate management principles into management practices.

MCA I SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 1.4: COMPUTER ORGANIZATION

Course Outcomes:

- Understand the functional units of computer and how they operate, interact and communicate.
- Familiar with different types of number systems and simplification of Boolean expressions.
- Learn the functions of flip-flops, counters and registers.
- Acquire knowledge on ALU and memory units functioning.
- Acquire knowledge on control unit and input / output units functioning.

MCA I SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 1.5: PROGRAMMING WITH C

Course Outcomes

- Understand the basic concepts of C programming languages and design algorithms to solve simple problems.
- Understand the various steps in Program development.
- Learn how to write modular and readable C Programs
- Demonstrate the ability to correct, test and debug C programs.

MCA II SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 2.1: OPERATIONS RESEARCH

Course Outcomes

- The student can identify and develop operational research models from the verbal description of the real and be able to understand to define and formulate linear programming problems with limitations.
- Student are able to Solve linear programming problems using appropriate techniques and interpret the results obtained which can be translated to solutions for action.
- Student learns queuing theory, transportation models and replacement models, student understands in solving network scheduling problems with PERT/CPM techniques.
- A student can understand Inventory system and also able to give solutions to many inventory problems.
- Student develops Cognitive skills to review, critically analyze, consolidate and Synthesize knowledge to identify and provide solutions to complex problems with intellectual independence.

MCA II SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 2.2: COMPUTER BASED FINANCIAL ACCOUNTANCY

Course Outcomes

- Student understands the importance of financial accountancy in business
- A student can gain knowledge in financial accounting, cost accounting and management accounting.
- Every student can understand the importance of budgeting and also learns various types of budgeting methods.
- Student knows the role of computers in preparation of financial accounting through Tally package.

MCA II SEMESTER (w.e.f. Academic Year 2019-2020)**MCA 2.3: DATA STRUCTURES****Course Outcomes:**

- Analyze various ways of representing a Data Structure like stacks, queues, linked lists, trees, graphs and hash tables.
- Develop sorting and searching algorithms.
- Handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.
- Identify suitable data structure for computational problem solving.

MCA II SEMESTER (w.e.f. Academic Year 2019-2020)**MCA 2.4: OBJECT ORIENTED PROGRAMMING WITH C++****Course Outcomes**

- Master the fundamental principles of Object Oriented Programming Concepts.
- Provides in-depth coverage of object-oriented programming principles and techniques using C++.
- Adeptness of object oriented programming in developing solutions to problems by using data abstraction, encapsulation and inheritance.
- Ability to implement one or more patterns involving realization of an abstract interface and utilization of polymorphism in the solution of problems which can take advantage of dynamic dispatching.
- Understands how to achieve data hiding concepts in C++.
- Learns file processing, generic programming and exception handling features in C++.
- Understands process of object oriented system development.

MCA II SEMESTER (w.e.f. Academic Year 2019-2020)**MCA 2.5: OPERATING SYSTEMS****Course Outcomes:**

- Understand the basic operating system concepts such as processes, threads, scheduling, synchronization, deadlocks, memory management, file and I/O subsystems and protection.
- Acquaintance with the class of abstractions affords by general purpose operating systems that aid the development of user applications.
- Able to use operating systems effectively.

MCA III SEMESTER (w.e.f. Academic Year 2019-2020)**MCA 3.1: JAVA PROGRAMMING****Course Outcomes:**

- Identify classes, objects, members of a class and relationships among them needed for a specific problem.
- Write Java application programs using OOP principles and proper program structuring.
- Demonstrate the concepts of polymorphism and inheritance.
- Ability to write Efficient programs that handle exceptions
- Create user friendly interface.

MCA III SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 3.2: COMPUTER NETWORKS

Course Outcomes:

- Gain the knowledge on to master the terminology and concepts of the OSI reference model and the TCP-IP reference model.
- Apply the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks.
- Demonstrate operation of network and its management commands
- Simulate and demonstrate the performance of GSM and CDMA
- Implement data link layer and transport layer protocols
- Effectively communicate the contemporary issues in networking technologies

MCA III SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 3.3: DATABASE MANAGEMENT SYSTEMS

Course Outcomes

- The Student will understand the role of a database management system in an organization.
- Student learns to construct simple and moderately advanced database queries using Structured Query Language (SQL).
- An understanding of normalization theory & ER Diagrams and apply such knowledge to the normalization of a database will be learned by the student in this programme.
- A student can learn important features of DBMS such as query processing methods, Transaction management, concurrency control mechanism, Recovery control mechanism.
- Student thoroughly understands how to organize, maintain and retrieve - efficiently, and effectively - information from a DBMS.

MCA III SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 3.4/3.5 (1): DESIGN AND ANALYSIS OF ALGORITHMS

Course Outcomes

- Ability to argue the correctness and analyze the running time of algorithms for the problems in various domains
- Describe the different problem solving techniques, derive and solve the different algorithms for those problems under each technique.
- Solve problems using algorithm design methods, introduce P and NP classes.

MCA III SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 3.4/3.5 (2): DISTRIBUTED OPERATING SYSTEMS

Course Outcomes:

- Understand the issues involved in process and resource management.
- Learn the fundamental principles of distributed systems and acquire hands-on experience in developing distributed protocols.
- Acquire knowledge on system level support required for distributed system.
- Understand communication process, file system, memory management and synchronization in distributed operating system environment.

MCA III SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 3.4/3.5 (3): MOBILE APPLICATION DEVELOPMENT

Course Outcomes:

- Install and configure Android application development tools.
- Design and develop user Interfaces for the Android platform.
- Apply Java programming concepts to Android application development.

MCA III SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 3.4/3.5 (4): SYSTEM SIMULATION

Course Outcomes

- Basic concepts in Modelling and Simulation.
- Classify various simulation models and give practical examples for each category.
- Construct a model for a given set of data and motivate its validity.
- Generate and test random number variates and to develop simulation model.
- Analyse output data produced by a model and test validity of the model.
- Understand different methods for random number generation.
- Able to describe the components of continuous and discrete systems to simulate.
- Able to model any system from different fields.
- Know how to simulate any discrete system using queuing systems.

MCA III SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 3.4/3.5 (5): SYSTEMS PROGRAMMING

Course outcomes

- Understand the basics of system programs like editors, compiler, assembler, linker, loader, interpreter and debugger.
- Know the basic design of various system software & implement various system software.
- Understand the execution process of high level language programs i.e. how linker and loader create an executable program from an object module created by assembler and compiler.
- Understand the various phases of compiler and compare its working with assembler.
- Know the various editors and debugging techniques

MCA III SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 3.4/3.5 (6): TECHNICAL COMMUNICATION AND COMPUTER ETHICS

Course outcomes

- Make students familiar with the fundamental concepts of Spoken English and Computer Ethics.
- Examine the Ethical issues that arise as a result of increasing use of Computers, and the Responsibilities of those who work with Computers, either as Computer Science Professionals or end users.
- Apply Professional Ethics to solve Ethical Dilemma & Identify their Professional responsibilities.

MCA III SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 3.4/3.5 (7): UNIX & NETWORK PROGRAMMING

Course Outcomes:

- Ability to understand and reason out the working of Unix Systems
- Able to build an application/service over a Unix system.
- Understand the key protocols which support the Internet.
- Familiar with several common programming interfaces for network communication

MCA IV SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 4.1: COMPUTER GRAPHICS

Course Outcomes:

- Understand the structure of modern computer graphics systems and the basic principles of implementing computer graphics primitives.
- Familiarize with key algorithms for modeling and rendering graphical data.
- Develop design and problem solving skills with application to computer graphics.
- Use contextual knowledge to develop interactive user interfaces related to societal applications.

MCA IV SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 4.2: ADVANCED JAVA & WEB TECHNOLOGIES

Course Outcomes:

- Interpret the need for advanced Java concepts like enumerations and collections in developing modular and efficient programs
- Illustrate database access and details for managing information using the JDBC API
- Can develop Java-based web application architecture with Servlets.

MCA IV SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 4.3: SOFTWARE ENGINEERING

Course Outcomes

- Ability to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment
- Ability to classify different types of software requirements and their gathering techniques.
- Ability to Convert the requirements model into the design model and demonstrate use of software and user interface design principles.
- Acquire knowledge to design applicable solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal and economic concerns.
- Understand how to 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.
- Investigate the reason for bugs and analyze the principles in software testing to prevent and remove bugs.
- Ability to Implement various test processes for quality improvement

MCA IV SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 4.4/4.5 (1): ADVANCED DATABASE MANAGEMENT SYSTEMS

Course Outcomes

- Student learns centralized & client server architecture, server system architectures, parallel & distributed systems and various network types.
- Student understands how object based relational model helps to address complex data types and also learns how persistent programming languages handle persistent data.
- Student understands the theoretical and practical aspects of the database technologies and to know the need of distributed database technology to tackle deficiencies of the centralized database systems.
- A student learns about homogeneous & heterogeneous databases and various design issues in distributed databases.
- Student understands how query processing works in distributed databases and learns about advance transaction processing concepts.

MCA IV SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 4.4/4.5 (2): ARTIFICIAL INTELLIGENCE

Course Outcomes:

- Acquire the skills for representing knowledge using appropriate technique for a given problem.
- Learn the difference between optimal reasoning and human like reasoning.
- Understand the notions of state space representation, exhaustive search, and heuristic search along with time and space complexities.
- Learn different knowledge representation schemes.
- Acquire knowledge on various phases in natural language processing.
- Understand the architecture, features of expert systems.
- Learn pattern reorganization techniques.

MCA IV SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 4.4/4.5 (3): ENTREPRENEURSHIP AND INNOVATION DEVELOPMENT

Course Outcomes:

- Understand Attitudes, values, characteristics, behaviour, and processes associated with possessing an entrepreneurial mindset and engaging in successful appropriate entrepreneurial behaviour.
- Identify entrepreneurship and innovation from both a theoretical and practical perspective, and the role of the entrepreneur in the new enterprise creation process.
- The ways in which entrepreneurs perceive opportunity, manage risk, organise resources and add value.
- Develop a plan for implementing entrepreneurial activities in a globalised and competitive environment being responsible for the social, ethical and culture issues.
- Critique a plan for implementing entrepreneurial activities in a globalised and competitive environment being mindful of the social, ethical and culture issues.
- Engage in a continuing learning process through the interaction with peers in related topics, as individuals and as team member.

MCA IV SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 4.4/4.5 (4): PRINCIPLES OF PROGRAMMING LANGUAGES

Course Outcomes:

- understand programming principles and its roles in languages
- understand and develop well-structured programs
- able to use the basic data structures through logic programming

MCA IV SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 4.4/4.5 (5): MULTI MEDIA SYSTEMS

Course Outcomes:

- Understand about various latest interactive multimedia devices, the basic concepts about images and image formats.
- Gain Knowledge about data compression techniques, image compression techniques like JPEG, video compression techniques like MPEG, and the basic concepts about animation.
- Develop an interactive multimedia presentation by using multimedia devices
- Identify theoretical aspects in designing multimedia applications surrounding the emergence of multimedia technology.

MCA IV SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 4.4/4.5 (7): BLOCK CHAIN TECHNOLOGY

Course Outcomes:

- Understand the architectural components of a block chain system
- Understand the inner workings of smart contracts as means for developing decentralized applications
- understand the details of interactions between the enclosed smart contract network and the external world, be aware of further implications these interactions pose to the aspect of decentralization

MCA V SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 5.1: BIG DATA ANALYTICS

Course Outcomes:

- Learn the basic concepts and principles of data mining and data warehousing.
- Ability to perform data mining techniques like association rule mining, classification and clustering on data sets.
- Able to select and apply proper Data mining algorithms to build analytical applications.
- Understand HADOOP and Map Reduce technologies associated with big data analytics.
- Able to analyze the big data applications using Pig and Hive.

MCA V SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 5.2: INTERNET OF THINGS

Course Outcomes:

- Familiarity with the essential protocols of IoT and their operations
- Design and implementation of IoT networks
- Identifying various design parameters for developing IoT applications

MCA V SEMESTER (w.e.f. Academic Year 2019-2020)
MCA 5.3: NETWORK SECURITY

Course Out Comes:

- Identify information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of finite fields and number theory.
- Ability to compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication.
- Apply the knowledge of cryptographic utilities and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes.
- Ability to Apply different digital signature algorithms to achieve authentication and create secure applications.
- Ability to Apply network security basics, analyze attacks on networks and evaluate the performance of firewalls and security protocols.
- Apply the knowledge of cryptographic utilities and authentication mechanisms to design secure different applications.

MCA V SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 5.4/5.5 (1): CLOUD COMPUTING

Course Outcomes:

- Ability to Understand the current cloud technologies and understand the techniques of big data analysis in cloud.
- Analyze the Cloud computing setup with it's vulnerabilities and applications using different architectures
- Ability to introduce the broad perceptive of cloud architecture and Models.
- Explore Assess cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application
- Broadly educate to know the impact of engineering on legal and societal issues involved in addressing the security issues of cloud computing
- Ability to Apply and design suitable Virtualization concept, Cloud Resource Management.
- Explore some important cloud computing driven commercial systems such as Google Apps, Microsoft Azure, IBM and Amazon Web Services and other business cloud applications.
- Ability to apply different cloud programming model as per need.

MCA V SEMESTER (w.e.f. Academic Year 2019-2020)**MCA (IE) 5.4/5.5 (2): SOFT COMPUTING****Course Outcomes**

- Identify and describe soft computing techniques and their roles in building intelligent machines
- Evaluate and compare solutions by various soft computing approaches for a given problem.
- Apply fuzzy logic and reasoning to handle uncertainty and solve engineering problems.
- Apply genetic algorithms to combinatorial optimization problems.
- Apply neural networks to pattern classification and regression problems.

MCA V SEMESTER (w.e.f. Academic Year 2019-2020)**MCA (IE) 5.4/5.5 (3): PYTHON & R PROGRAMMING****Course Outcome (CO)**

- Create a software application using the Python and R programming language.
- Debug a software application written in the Python and R programming language.
- Test a software application written in the Python and R programming language.

MCA V SEMESTER (w.e.f. Academic Year 2019-2020)**MCA (IE) 5.4/5.5 (4): IMAGE PROCESSING****Course Outcomes:**

The Student Should Be Made To:

- Learn Fundamental concepts in digital image processing.
- Be Exposed to Simple Image Processing Techniques.
- Learn relationship between mathematical tools and image representation
- Learns basic Image Compression methods.
- Be Familiar with point, line and edge detection methods for Segmentation.
- Understands Morphological Image Processing and Boundary Descriptors.

MCA V SEMESTER (w.e.f. Academic Year 2019-2020)**MCA (IE) 5.4/5.5 (5): USER INTERFACE DESIGN****Course Outcomes**

- A student learns usability of Interactive Systems, Guidelines, Principles & Theories and development methodologies.
- Student learns good understanding of the Visual Basic language structure and language syntax.
- Student will have the capability to analyze and finding suitable and effective solutions to Windows based applications using classes and objects.
- Student can learn to write Database Programs with Visual Basic.
- Students will have exposure in Windows API, OLE Automation and VBA.

MCA V SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 5.4/5.5 (6): DEEP LEARNING

Course Outcomes

- understand major deep learning algorithms, the problem settings, and their applications to solve real world problems.
- Identify the deep learning algorithms which are more appropriate for various types of learning tasks in various domains.
- Implement deep learning algorithms and solve real-world problems.

MCA V SEMESTER (w.e.f. Academic Year 2019-2020)
MCA (IE) 5.4/5.5 (7): SOFTWARE TESTING

Course Outcomes:

- Investigate the reason for bugs and analyze the principles in software testing to prevent and remove bugs.
- Ability to Implement various test processes for quality improvement .
- Ability to Design test planning and manage the test process .
- Ability to Apply the software testing techniques in commercial environment .
- Ability to Use practical knowledge of a variety of ways to test software and an understanding of some of the tradeoffs between testing techniques.

EXTERNAL ELECTIVE - III SEMESTER (w.e.f. Academic Year 2019-2020)
CSEE01: C PROGRAMMING

Course outcomes

- Understand the basic concepts of C programming languages and design algorithms to solve simple problems.
- Understand the various steps in Program development.
- Learn how to write modular and readable C Programs
- Demonstrate the ability to correct, test and debug C programs.

EXTERNAL ELECTIVE- III SEMESTER (w.e.f. Academic Year 2019-2020)
CSEE02: WEB DESIGNING

Course Outcomes

- Ability to create web elements like buttons, banners & Bars, Forms and validations for your website.
- Ability to successfully design and implement a web site.
- Ability to create and optimize images, video and audio for the web.
- Ability to write accessible Cascading Style Sheets.