

MCA

Programme Outcomes

The program focuses on the skill enhancement of students in Computer Application in which following skills are enhanced:

- Apply the knowledge of mathematics and computing fundamentals to various real life situations for any given environment.
- Design and develop applications to analyze and solve all computer science related problems.
- Design applications for any desired needs with appropriate considerations for any specific need on societal and environmental aspects.
- Analyze and review literatures to invoke the research skills to design, interpret and make inferences from the resulting data.
- Integrate and apply efficiently the contemporary IT tools to all computer applications.
- Solve and work with a professional context pertaining to ethics, social, cultural and cyber regulations
- Involve in perennial learning for a continuous career development and progress as a computer professional
- Function effectively both as a team leader and team member on multi disciplinary projects to demonstrate computing and management skills
- Communicate effectively and present technical information in oral and written reports
- Utilize the computing knowledge efficiently in projects with concern for societal, environmental, and cultural aspects
- Function competently as an individual and as a leader in multidisciplinary projects
- Create and design innovative methodologies to solve complex problems for the betterment of the society
- Apply the inherent skills with absolute focus to function as an successful entrepreneur

This program fit the students for following job role:-

- Software Developer
- Hardware Engineer
- Database Engineer
- Cloud Architect
- Data Scientist
- Web Developer
- Network Engineer

COURSE OUTCOMES

SEMESTER – 3

COURSE NAME: Design and Analysis of Algorithms

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Argue the correctness of algorithms using inductive proofs and invariants.
- Analyze worst-case running times of algorithms using asymptotic analysis.
- Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize divide-and-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.
- Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize dynamic-programming algorithms, and analyze them.
- Describe the greedy paradigm and explain when an algorithmic design situation calls for it. Recite algorithms that employ this paradigm. Synthesize greedy algorithms, and analyze them.
- Explain the major graph algorithms and their analyses. Employ graphs to model engineering problems, and synthesize new graph algorithms.

COURSE NAME: Software Engineering

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Acquire strong fundamental knowledge in science, mathematics, fundamentals of computer science, software engineering and multidisciplinary engineering to begin in practice as a software engineer.
- Design applicable solutions in one or more application domains using software engineering approaches that integrate ethical, social, legal and economic concerns.
- 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.
- 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.

COURSE NAME: Decision Support Systems

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- describe the decision-making process, the concepts and principles of a decision support system.
- identify decision support tools that can aid decision making.
- apply system development methodology to develop a decision support system.
- develop a functional prototype of a decision support system for a given case.

COURSE NAME: Programming in Java

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

After studying this course, students should be able to:

- **Knowledge and Understanding:**
 - Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.
 - Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
- **Intellectual(Cognitive/ Analytical) Skills:**
 - Evaluate how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.
 - understand and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
- **Practical Skills:**
 - Design, implement, test, debug, and document programs that use basic data types and computation, simple I/O, conditional and control structures, string handling and functions.
 - The importance of Classes & objects and will be able to implement it along with constructors, Arrays and Vectors.
 - Develop computer-based systems.

COURSE NAME: Organisation Behaviour and Development

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Demonstrate the applicability of the concept of organizational behavior to understand the behavior of people in the organization.
- Demonstrate the applicability of analyzing the complexities associated with management of individual behavior in the organization.
- Analyze the complexities associated with management of the group behavior in the organization. Demonstrate how the organizational behavior can integrate in understanding the motivation (why) behind behavior of people in the organization.

COURSE NAME: System Software

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Understand the functions, features and design options of macro processors.
- Understand the functions and design options of loader, editor structure and functions and capabilities of an interactive debugging system.
- Analyze the working of Lexical analyzer (LEX) and Parser tool (YACC)
- Understand the proficiency in software development cost estimation, testing methodologies and author a software testing plan.

COURSE NAME: Computer based Optimization Techniques

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Relate key concepts and applications of various optimization techniques
- Identify the appropriate optimization technique for the given problem
- Formulate appropriate objective functions and constraints to solve real life optimization problems.

COURSE NAME: Data Mining and Data Warehousing

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Understand warehousing architectures and tools for systematically organizing large database and use their data to make strategic decisions.
- Understand KDD process for finding interesting pattern from warehouse.
- Remove redundancy and incomplete data from the dataset using data preprocessing methods.
- Characterize the kinds of patterns that can be discovered by association rule mining.
- Discover interesting patterns from large amounts of data to analyze for predictions and classification.
- Develop a data mining application for data analysis using various tools.

COURSE NAME: ERP Systems and Processes

CLASS - MCA SEMESTER – 3

Course Outcomes

After successful completion of the course students will be able to

- Make basic use of Enterprise software, and its role in integrating business functions
- Analyze the strategic options for ERP identification and adoption.
- Design the ERP implementation strategies.
- Create reengineered business processes for successful ERP implementation.

SEMESTER – 4

COURSE NAME: Operating Systems

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Describe the important computer system resources and the role of operating system in their management policies and algorithms.
- Understand the process management policies and scheduling of processes by CPU
- Evaluate the requirement for process synchronization and coordination handled by operating system
- Describe and analyze the memory management and its allocation policies.
- Identify use and evaluate the storage management policies with respect to different storage management technologies.
- Identify the need to create the special purpose operating system

COURSE NAME: Data Communication and Computer Networks

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Understand basic computer network technology.
- Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.
- Describe data link protocols, multi-channel access protocols and IEEE 802 standards for LAN.
- Describe routing and congestion in network layer with routing algorithms and classify IPV4 addressing scheme.
- Discuss the elements and protocols of transport layer

COURSE NAME: Web Programming using ASP.Net

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- To develop Webpages, Static Websites, Dynamic Websites.
- To use ASP as Server Side Scripting Language.
- To use PHP as Server Side Scripting Language.
- To use JSP, JavaScript.
- To understand database and it's connectivity with Server Side Scripting language.
- To develop Web Applications with MySQL/SQL as backend.

COURSE NAME: Business Intelligence

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Describe the concepts and components of Business Intelligence (BI).
- Critically evaluate use of BI for supporting decision making in an organisation.
- Understand and use the technologies and tools that make up BI (e.g. Data warehousing, Data reporting and use of Online Analytical Processing (OLAP)).
- Understand and design the technological architecture that underpins BI systems.
- Plan the implementation of a BI system.

COURSE NAME: Object Oriented Modelling and design using UML

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Model the software development life cycle
- Understand the UML notation and symbols
- Implement the object-oriented approach to analyzing and designing systems and software solutions
- employ the UML notation to create effective and efficient system designs

COURSE NAME: Embedded Systems

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Understand the concept of embedded system, microcontroller, different components of microcontroller and their interactions.
- Get familiarized with programming environment to develop embedded solutions.
- Program ARM microcontroller to perform various tasks.
- Understand the key concepts of embedded systems such as I/O, timers, interrupts and interaction with peripheral devices.

COURSE NAME: Compiler Design

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Understand fundamentals of compiler and identify the relationships among different phases of the compiler.
- Understand the application of finite state machines, recursive descent, production rules, parsing, and language semantics.
- Analyze & implement required module, which may include front-end, back-end, and a small set of middle-end optimizations.
- Use modern tools and technologies for designing new compiler.

COURSE NAME: Software Testing and Quality Assurance

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Describe software engineering testing process
- Describe the quality assurance process and its role in software development.
- Demonstrate variety of testing techniques, methods, and tools.

- Describe the state of the practice verification and validation techniques.
- Demonstrate proficiency in managing a software project to customer requirements.

COURSE NAME: Graph Theory

CLASS - MCA SEMESTER – 4

Course Outcomes

After successful completion of the course students will be able to

- Apply theories and concepts to test and validate intuition and independent mathematical thinking in problem solving.
- Integrate core theoretical knowledge of graph theory to solve problems.
- Reason from definitions to construct mathematical proofs
- Evaluate and synthesize published research papers.
- Analyze new networks using the main concepts of graph theory.

SEMESTER – 5

COURSE NAME: Artificial Intelligence

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Demonstrate fundamental understanding of the history of artificial intelligence (AI) and its foundations.
- Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning.
- Demonstrate awareness and a fundamental understanding of various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
- Demonstrate proficiency developing applications in an 'AI language', expert system shell, or data mining tool.
- Demonstrate proficiency in applying scientific method to models of machine learning.
- Demonstrate an ability to share in discussions of AI, its current scope and limitations, and societal implications.

COURSE NAME: Computer Graphics

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Demonstrate an understanding of contemporary graphics hardware.
- Create interactive graphics applications in C++ using one or more graphics application programming interfaces.
- Functions to implement graphics primitives.
- Demonstrate geometrical transformations.
- Demonstrate an understanding of the use of object hierarchy in graphics applications.

COURSE NAME: Theory of Computation

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- design Finite Automata machines for given problems;
- analyze a given Finite Automata machine and find out its Language;
- design Pushdown Automata machine for given CF language(s);
- generate the strings/sentences of a given context-free languages using its grammar;
- design Turing machines for given any computational problem

COURSE NAME: E-Commerce

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Analyze the impact of E-commerce on business models and strategy.
- Describe the major types of E-commerce.
- Explain the process that should be followed in building an E-commerce presence.
- Identify the key security threats in the E-commerce environment.
- Describe how procurement and supply chains relate to B2B E-commerce.

COURSE NAME: Software Project Management

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

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

COURSE NAME: Cloud Computing

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Understand the concepts, characteristics, delivery models and benefits of cloud computing
- Understand the key security and compliance challenges of cloud computing
- Understand the key technical and organisational challenges
- Understand the different characteristics of public, private and hybrid cloud deployment models.

COURSE NAME: Network Security

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Identify some of the factors driving the need for network security
- identify and classify particular examples of attacks
- define the terms vulnerability, threat and attack
- identify physical points of vulnerability in simple networks
- compare and contrast symmetric and asymmetric encryption systems along with their vulnerability to attack, and explain the characteristics of hybrid systems.

COURSE NAME: Ethical Hacking

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- Plan a vulnerability assessment and penetration test for a network.
- Execute a penetration test using standard hacking tools in an ethical manner.

- Report on the strengths and vulnerabilities of the tested network.
- Identify legal and ethical issues related to vulnerability and penetration testing.

COURSE NAME: Data Science & Machine Learning

CLASS - MCA SEMESTER – 5

Course Outcomes

After successful completion of the course students will be able to

- develop relevant programming abilities.
- demonstrate proficiency with statistical analysis of data.
- develop the ability to build and assess data-based models.
- execute statistical analyses with professional statistical software.
- demonstrate skill in data management.

Semester-6

Project Dissertation (Industrial Training and Project in Software/IT industry)