

MASTER OF COMPUTER APPLICATIONS – MCA

Program Outcomes (POs):

PO1.	Identify business problems, formulate them under a mathematical framework and solve using knowledge of computing and decision sciences
PO2.	Design and implement components of business systems that are agile and responsive to change through application of software design principles
PO3.	Apply data analysis techniques on large sized datasets using contemporary computational tools and interpret the results in specific application domains and multidisciplinary contexts
PO4.	Design sustainable solutions to projects and problems in a professional and ethical manner, giving due importance to social, environmental, regulatory and cultural issues
PO5.	Understand client requirements for development of software through effective communication and developing solutions using standard programming languages, tools and frameworks
PO6.	Create novel approaches to computing problems, develop innovative methodologies for solving them and explain limitations of the solutions to stakeholders.
PO7.	Apply relevant concepts to complex problems using rapidly evolving tools.
PO8.	Recognize importance of working effectively in environments with diversity and engage in lifelong learning and skill enhancement.

MCA I Semester

MCA 1.1	DATA STRUCTURES AND ALGORITHMS
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Course Outcomes

CO	Description
CO1	Describe how arrays, records, linked structures, stacks, queues, trees, and graphs are represented in memory and used by algorithm.
CO2	Demonstrate different methods for traversing trees.
CO3	Compare alternative implementations of data structures with respect to performance.
CO4	Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing.

MCA 1.2	PROBABILITY, STATISTICS & QUEUING THEORY
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Course Outcomes

CO	Description
CO1	Define and explain basic concepts in probability theory and how to translate real- world problems into probability models
CO2	Solve standard problems that include random variables, discrete and continuous probability distributions
CO3	Perform Test of Hypothesis and construct a confidence interval to estimate population parameters
CO4	Compute and interpret the results of Correlation Analysis, Multivariate Regression, Chi-Square test for Independence and Goodness of Fit
CO5	Explain basic concepts in Markov processes, M/M/1 and M/M/C queueing systems.

MCA 1.3	COMPUTER ORGANIZATION
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Course Outcomes

CO	Description
CO1	Describe the internal organization of a computer, CPU, memory unit, input/outputs and the functional units of a processor
CO2	Manipulate representations of numbers stored in digital computers
CO3	Explain addressing modes, instruction formats and program control statements
CO4	Understand the theory and architecture of central processing unit and micro-sequencer.

MCA 1.4	OBJECT ORIENTED PROGRAMMING WITH JAVA
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Course Outcomes

CO	Description
CO1	The course aims to make the students learn programming in Java. Java language elements and characteristics including data types operators and control structures are discussed in order to make the students develop Java applications.
CO2	The course also intended for students who would like to learn how to develop internet based applications graphical user interface (GUI) and graphics in both AWT and SWING.
CO3	Advanced Java topics discussed helps students writing programs for Java database connectivity with JDBC; Manipulating databases with JDBC; Programming for Internet JavaServer pages

MCA 1.5	OPERATING SYSTEMS
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Course Outcomes

CO	Description
CO1	Describe the basic concepts of operating systems, including structure and components
CO2	Explain how memory, I/O devices, files, processes and threads are managed, and evaluate the performance of various scheduling algorithms
CO3	Explain the concepts covered in concurrency control, including mutual exclusion and synchronization, deadlock and starvation
CO4	Understand key concepts on physical and virtual memory, scheduling, I/O and file systems and mass storage structures.

MCA II Semester

MCA 2.1	WEB TECHNOLOGIES
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Course Outcomes

CO	Description
CO1	Understand and be able to analyse any real time web application
CO2	Acquire working knowledge to develop web applications using both client side and server side scripting and retrieving data from databases
CO3	Appreciate the importance of MVC architecture pattern in development of web applications

MCA 2.2	DATA BASE MANAGEMENT SYSTEMS
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Course Outcomes

CO	Description
CO1	Apply formal database ideas of ER diagrams, functional dependencies and normalization in development of real world database applications
CO2	Be familiar with modern database application design tools and interfaces
CO3	Understand the notion of concurrency, its importance in transactions and various recovery techniques.

MCA 2.3	ARTIFICIAL INTELLIGENCE
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Course Outcomes

CO	Description
CO1	Understand AI problem characteristics and state space approach for solving AI problem.
CO2	The student will have learned several optimal search strategies and the use of heuristics
CO3	Understand relational, inferential, inheritable and procedural knowledge and the corresponding knowledge representation approaches acquire AI problem solving approaches to natural language processing, planning and expert systems.

MCA 2.4	BUSINESS ANALYTICS
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Course Outcomes

CO	Description
CO1	Describe data and models used for Business Analytics and apply various descriptive analytic techniques to analyze data
CO2	Estimating population parameters, interval estimates, construct confidence intervals and perform hypothesis testing
CO3	Estimate and interpret the parameters of simple linear regression and multiple linear regression
CO4	Apply forecasting models for various time series data including stationary time series
CO5	Implement models on spreadsheets, develop user-friendly applications and build linear optimization models on spreadsheets

MCA 2.5	Elective-I EMBEDDED SYSTEMS
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Course Outcomes

CO	Description
CO1	Describe embedded system architecture and its typical hardware
CO2	Understand tasks and task states, shared data and semaphores, message queues
CO3	Test embedded software on host machines using instruction set simulators

MCA III Semester

MCA 3.1	COMPUTER NETWORKS
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Course Outcomes

CO	Description
CO1	Understand the design and estimate the requirements for practical setup of a given network scenario and size
CO2	Realize the operation, maintenance and management of the internet by mapping the theoretical networking concepts to the real-time network scenarios
CO3	Demonstrate the applications of wireless networks and overview of advanced networking concepts
CO4	Identify different networking devices and their usage and functionality.

MCA 3.2	PYTHON PROGRAMMING
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Course Outcomes

CO	Description
CO1	Acquire programming knowledge on Basics of Python
CO2	Acquire programming knowledge on Text and File Handling
CO3	Develop Python programs to Mean, Median, Mode, Correlation
CO4	Acquire programming knowledge on NumPy, Pandas Library
CO5	Acquire programming knowledge on Graph Visualizations in Python and Data Analysis using Python

MCA 3.3	SOFTWARE ENGINEERING
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Course Outcomes

CO	Description
CO1	Define a problem and perform Requirements Engineering.
CO2	Draw UML diagrams for the requirements gathered
CO3	Implement the designed problem in Object Oriented Programming Language and test whether all the requirements specified have been achieved or not.

MCA 3.4	DATA WAREHOUSING & DATA MINING
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Course Outcomes

CO	Description
CO1	The student understands the differences between OLTP and OLAP.
CO2	The student learns how data cube technology supports summarization and querying high dimensional data.
CO3	The student is introduced to similarity, distance, information gain and other performance and error metrics used for evaluation of mining results.
CO4	The student is introduced to various approaches to association rule mining , supervised and unsupervised learning and the corresponding classification and clustering approaches involving decision trees, Bayesian approaches, model based and agglomerative approaches.

MCA 3.5	Elective II - NETWORK SECURITY AND CRYPTOGRAPHY
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Course Outcomes

CO	Description
CO1	Understand the importance of network and data security in the Internet and in the distributed environments
CO2	Apply various cryptographic techniques in different contexts
CO3	Identify the different types of network security issues and their remedies.

MCA IV Semester

MCA 4.1	DATA SCIENCE
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Course Outcomes

CO	Description
CO1	Describe about Data Science and its process
CO2	Differentiate between the classification and regression methods
CO3	Apply clustering and evaluate the methods
CO4	Understand and analyze the text mining and time series forecasting applications.

MCA 4.2	Elective-III Internet of Things (IoT)
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Course Outcomes

CO	Description
CO1	Describe the framework, architecture of IoT, technology behind IoT and the key components that makeup an IOT system
CO2	Understand the design principles for connected devices, for web connection and web communication protocols for connected devices
CO3	Collect, store, organize and process data using IoT cloud-based services and appreciate the role of big data, cloud computing and data analytics in a typical IoT system
CO4	Understand key concepts in sensors, RFIDs, and wireless sensor networks including applications in industrial IoT and automotive IoT,
CO5	Understand embedded computing basics, prototyping, designing software for IoT applications and various IoT supported hardware platforms including Raspberry pi, ARM Cortex Processors.