



AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

(Approved by A.I.C.T.E., New Delhi & Permanently Affiliated to JNTU-GV, Vizianagaram)

NAAC “A+” Accredited Institute

Cherukupally (Village), Near Tagarapuvalasa Bridge, Vizianagaram (Dist), AP, Pin-531162.

www.aietta.ac.in, principal@aietta.ac.in

MASTER OF COMPUTER APPLICATIONS (MCA)

COURSE OUTCOMES – R24

R24 I SEMESTER

R24MCA1101 – Business Communication

S. No.	CO No.	Course Outcome
1	R24MCA1101.1	Understand the fundamentals of Communication Process, Listening Skills, Personality Development.
2	R24MCA1101.2	Analyze Organizational, Interpersonal & Intrapersonal Communication.
3	R24MCA1101.3	Apply appropriate verbal and Non-verbal Communication, Body Language, Business Etiquette.
4	R24MCA1101.4	Develop effective Written Communication, Reports, Business Letters, Resume Writing.
5	R24MCA1101.5	Demonstrate Presentation Skills, Group Discussion, Interview Techniques.

R24MCA1102 – Mathematical and Statistical Foundations

S. No.	CO No.	Course Outcome
1	R24MCA1102.1	Apply Basic Probability, Random Variables, Bayes theorem and real-world problems.
2	R24MCA1102.2	Analyze Sampling and Estimation Theory, probability distributions for data-driven decision making.
3	R24MCA1102.3	Apply Tests of Hypothesis and Significance tests and interpret experimental data.
4	R24MCA1102.4	Analyze Algebraic Structures and Number Theory, computational problems.
5	R24MCA1102.5	Apply Graph Theory concepts, analyse and solve network-based problems.

R24MCA1104 – C & Data Structures

S. No.	CO No.	Course Outcome
1	R24MCA1104.1	Implement basic programs by using C concepts.
2	R24MCA1104.2	Implement functions, including prototypes, argument passing (by value and by reference), and recursion.
3	R24MCA1104.3	Utilize pointer concepts such as address operators, pointer arithmetic, dynamic memory allocation, and pointer-related data structures (arrays, structures).
4	R24MCA1104.4	Understand linear data structures, including stacks and queues, and their importance and operations.
5	R24MCA1104.5	Utilize singly linked lists for practical applications like polynomial and sparse matrix expressions, and understand doubly and



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R24MCA1103 – Computer Organization & Operating Systems

S. No.	CO No.	Course Outcome
1	R24MCA1103.1	Understand the basic organization of computer and different instruction formats and addressing modes.
2	R24MCA1103.2	Analyze the concept of pipelining, segment registers and CPU organization, including the processing unit and control mechanisms.
3	R24MCA1103.3	Understand and analyze various issues related to memory hierarchy and memory management.
4	R24MCA1103.4	Evaluate various modes of data transfer and analyze process synchronization, scheduling and deadlock-related issues between CPU and I/O systems.
5	R24MCA1103.5	Examine various interconnection structures of multiprocessors and analyze file-system and disk-management concepts.

R24MCA1105 – Object Oriented Programming with Java

S. No.	CO No.	Course Outcome
1	R24MCA1105.1	Describe the uses of Object-Oriented Programming concepts.
2	R24MCA1105.2	Apply OOP concepts to solve real-world problems.
3	R24MCA1105.3	Distinguish the concepts of packages and interfaces.
4	R24MCA1105.4	Demonstrate exception handling and multithreaded applications with synchronization.
5	R24MCA1105.5	Design GUI-based applications using AWT and Swing and establish Java Database Connectivity (JDBC).

R24MCA1107 – C & Data Structures Lab

S. No.	CO No.	Course Outcome
1	R24MCA1107.1	Implement various basic data structures and their operations.
2	R24MCA1107.2	Apply sorting and searching algorithms to given numbers and analyze their implementation.
3	R24MCA1107.3	Implement various tree and graph operations and develop applications using data structures.

R24MCA1108 – Java Programming Lab

S. No.	CO No.	Course Outcome
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1	R24MCA1108.1	Apply Java programming and OOP concepts such as classes, objects, methods, recursion, polymorphism and inheritance to solve computational problems.
2	R24MCA1108.2	Implement Java packages, file handling, exception handling, multithreading and synchronization concepts to develop Java applications.
3	R24MCA1108.3	Design and implement GUI-based applications using AWT and Swing, handle user events, and establish database connectivity using JDBC.

R24MCA1106 – Operating Systems & Linux Lab

S. No.	CO No.	Course Outcome
1	R24MCA1106.1	Implement and compare CPU and disk scheduling algorithms and apply process management concepts using system calls.
2	R24MCA1106.2	Implement memory management, page replacement, and deadlock avoidance/prevention algorithms to solve operating system resource management problems.
3	R24MCA1106.3	Execute Linux/Unix commands and develop C programs and shell scripts to perform computational and system-level tasks.

R24 II SEMESTER

R24MCA12051 – Advanced Data Structures

S. No.	CO No.	Course Outcome
1	R24MCA12051.1	Ability to write and analyze algorithms for algorithm correctness and efficiency
2	R24MCA12051.2	Master a variety of advanced abstract data types (ADT) and data structures and their implementation
3	R24MCA12051.3	Demonstrate various searching, sorting and hash techniques and be able to apply and solve problems of real life
4	R24MCA12051.4	Design and implement variety of data structures including linked lists, binary trees, heaps, graphs and search trees
5	R24MCA12051.5	Ability to compare various search trees and find solutions for IT related problems

R24MCA1202 – Computer Networks



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S. No.	CO No.	Course Outcome
1	R24MCA1202.1	Explain the network architecture, TCP/IP and OSI reference models
2	R24MCA1202.2	Identify and understand various techniques and modes of transmission
3	R24MCA1202.3	Describe routing and congestion in network layer with routing algorithms and classify IPV4 addressing scheme
4	R24MCA1202.4	Discuss the elements and protocols of transport layer
5	R24MCA1202.5	Develop network security and define various protocols such as FTP, HTTP, Telnet, DNS

R24MCA1207 – Computer Networks Lab

S. No.	CO No.	Course Outcome
1	R24MCA1207.1	Implement and analyze various network protocols, error detection techniques, and routing algorithms such as Dijkstra’s shortest path and distance vector routing.
2	R24MCA1207.2	Implement and utilize IPC mechanisms such as pipes, FIFOs, message queues and shared memory, and apply synchronization techniques for effective communication between processes.
3	R24MCA1207.3	Design, develop and test TCP and UDP client-server applications for communication, file transfer and concurrent request processing.

R24MCA1201 – Data Base Management Systems

S. No.	CO No.	Course Outcome
1	R24MCA1201.1	Illustrate the concept of databases, database management systems, database languages, database structures and their work.
2	R24MCA1201.2	Apply ER modelling and Relational modelling for designing simple databases.
3	R24MCA1201.3	Summarize the concepts related to relational model and SQL and Write database queries using relational algebra and structured query language.
4	R24MCA1201.4	Design and develop databases from the real world by applying the concepts of Normalization.
5	R24MCA1201.5	Outline the issues associated with Transaction Management and Recovery, Tree Structured and Hash-Based Indexing.

R24MCA1206 – Database Management System Lab

S. No.	CO No.	Course Outcome
1	R24MCA1206.1	Utilize SQL to execute queries for creating database and performing data manipulation operations.
2	R24MCA1206.2	Examine integrity constraints to build efficient databases.



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3	R24MCA1206.3	Apply queries using advanced concepts of SQL.
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R24MCA1204 – Data Warehousing and Data Mining

S. No.	CO No.	Course Outcome
1	R24MCA1204.1	Understand the basics of types of data, quality of data, suitable techniques required for preprocessing and measures required to perform data analysis.
2	R24MCA1204.2	Describe the need of classification, identify suitable techniques to perform classification, model building and evaluation.
3	R24MCA1204.3	Identify the requirements and usage of association rule mining on categorical and continuous data.
4	R24MCA1204.4	Evaluate clustering results and handle high-dimensional data challenges.
5	R24MCA1204.5	Describe the requirements and the need of web mining.

R24MCA1208 – Software Engineering and Design Pattern Lab

S. No.	CO No.	Course Outcome
1	R24MCA1208.1	Clearly articulate problem statements, develop flowcharts and SRS documents, perform effort estimation, project scheduling and risk management for software projects.
2	R24MCA1208.2	Design and model software systems using E-R diagrams, DFDs, CFDs and structured charts, and develop effective test cases based on requirements and design specifications.
3	R24MCA1208.3	Design and implement software design patterns using UML and Java to solve object-oriented design problems and manage software configuration through version and change control practices.

R24MCA2103 – Software Engineering and Design Patterns

S. No.	CO No.	Course Outcome
1	R24MCA2103.1	Define various software application domains and remember different process models used in software development.
2	R24MCA2103.2	Explain the need for software specifications, classify different types of software requirements and identify their gathering techniques.
3	R24MCA2103.3	Convert requirements models into design models and demonstrate the use of software and user interface design principles.
4	R24MCA2103.4	Illustrate appropriate design patterns to solve object-oriented design problems.
5	R24MCA2103.5	Evaluate design solutions using behavioral patterns and apply structural patterns to solve design problems.



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R24 III SEMESTER

R24MCA2102 – Internet of Thing

S. No.	CO No.	Course Outcome
1	R24MCA2102.1	Understand microcontrollers, embedded systems, and IoT basics.
2	R24MCA2102.2	Identify M2M communication, device connectivity and IoT applications.
3	R24MCA2102.3	Develop basic applications using Arduino and Raspberry Pi.
4	R24MCA2102.4	Analyze communication protocols and their use in IoT systems.
5	R24MCA2102.5	Implement cloud-based IoT solutions using AWS and other platforms.

R24IOT2111 – Internet of Things Lab

S. No.	CO No.	Course Outcome
1	R24IOT2111.1	Configure and program Arduino and Raspberry Pi to interface with various sensors and actuators for IoT-based applications.
2	R24IOT2111.2	Implement wireless communication and remote data control using Bluetooth, and integrate sensor data with cloud and local databases.
3	R24IOT2111.3	Develop network-based IoT applications using MQTT, TCP/UDP protocols for real-time data exchange and device communication.

R24MCA2108 – Machine Learning with Python

S. No.	CO No.	Course Outcome
1	R24MCA2108.1	Illustrate and comprehend the basics of Machine Learning with Python.
2	R24MCA2108.2	Demonstrate the algorithms of Supervised Learning and differentiate linear and logistic regression.
3	R24MCA2108.3	Demonstrate the algorithms of Unsupervised Learning and understand clustering algorithms.
4	R24MCA2108.4	Evaluate binning, feature engineering, pipeline interfaces and ensemble learning techniques.
5	R24MCA2108.5	Apply sentiment analysis and other machine learning techniques to various text-data case studies.

R24MCA2103 – Web Technologies

S. No.	CO No.	Course Outcome
1	R24MCA2103.1	Design and structure web pages using HTML and CSS.



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2	R24MCA2103.2	Create well-formed XML documents and use DTDs and Schemas.
3	R24MCA2103.3	Build server-side components using Servlets and JDBC.
4	R24MCA2103.4	Develop JSP and JavaScript-enabled dynamic web applications.
5	R24MCA2103.5	Design interactive web pages using PHP and AJAX for real-time functionality.

R24MCA2101 – Python Programming

S. No.	CO No.	Course Outcome
1	R24MCA2101.0 1	Understand Python syntax, control flow and function definitions
2	R24MCA2101.0 2	Apply strings, lists, and list operations in real-time scenarios
3	R24MCA2101.0 3	Demonstrate the use of dictionaries, tuples, sets, and related functions
4	R24MCA2101.0 4	Analyze file operations and implement regular expressions using Python
5	R24MCA2101.0 5	Design and develop advanced Python applications using object-oriented and modular programming principles

R24MCA2110 – Python Programming Lab

S. No.	CO No.	Course Outcome
1	R24MCA2110.1	Demonstrate the ability to write and execute Python programs using control structures, functions, and loops.
2	R24MCA2110.2	Apply Python data structures and file handling to develop real-time applications.
3	R24MCA2110.3	Implement and analyze searching, sorting, and algorithmic techniques using Python.

R24MCA2104 – Cryptography and Network Security

S. No.	CO No.	Course Outcome
1	R24MCA2104.1	Recall and demonstrate an understanding of basic security concepts, cryptographic goals, and symmetric encryption standards like DES and AES.
2	R24MCA2104.2	Apply number theory concepts to analyze and implement asymmetric encryption algorithms such as RSA, Rabin, ElGamal,



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3	R24MCA2104.3	Evaluate the effectiveness of cryptographic hash functions and analyze the working of firewalls and their configurations.
4	R24MCA2104.4	Analyze key management mechanisms and assess various user authentication protocols used in secure communications.
5	R24MCA2104.5	Design and evaluate secure communication systems using real-time security mechanisms like S/MIME and IP Security (IPSec).

R24 IV SEMESTER

R24MCA2203 – Deep Learning

S. No.	CO No.	Course Outcome
1	R24MCA2203.1	Demonstrate the mathematical foundation of neural networks.
2	R24MCA2203.2	Describe the machine learning basics.
3	R24MCA2203.3	Compare the different architectures of deep neural networks.
4	R24MCA2203.4	Build a convolutional neural network.
5	R24MCA2203.5	Build and train RNN and LSTMs.

R24MCA2208 – Software Testing Methodologies

S. No.	CO No.	Course Outcome
1	R24MCA2208.01	Describe software testing fundamentals, STLC phases, and testing methodologies.
2	R24MCA2208.02	Apply black-box and white-box testing techniques for effective defect detection.
3	R24MCA2208.03	Execute various validation and regression testing activities and distinguish their scopes and objectives.
4	R24MCA2208.04	Develop test plans, manage test documentation, and apply relevant software testing metrics.
5	R24MCA2208.05	Analyze automation tools and testing strategies for object-oriented and web-based applications.