


NAAC Accredited with 'A" Grade
Recognised by UGC under sections 2(f) and 12(b) & Affiliated to Bangalore University

DEPARTMENT OF COMPUTER APPLICATIONS

MCA

PROGRAM OUTCOMES

After Completion of MCA program student will be competent in

PO1 Knowledge: Understand information of computing and logical appropriate to the program.

PO2 Analysis: Categorize, formulate and progress clarifications to computational experiments.

PO3 Development: Design, implement and evaluate a computational scheme to meet preferred needs within accurate constrictions.

PO4 Ethics: Understand professional, ethical, permissible, safety and social issues and responsibilities for the computing profession.

PO5Social: Communicate and involve efficiently with various stakeholders.

PO6Logical Reasoning: Analyze influences of computing on individuals, organizations and society.

PO7Professional Development: Identify the need for and engage in continuing professional development.

PO8Research: Apply mathematical foundations, algorithmic principles and computer science theory in the modeling and design of computational systems in a way that establish comprehension of the compromises complex in design choices.

PO9Learning: Apply design and development principles in the assembly of software of varying complexity.

PROGRAM SPECIFIC OUTCOMES

PSO 1. Improve capability to determine leadership with team work, to solving time critical problems using analytical reasoning and moral human values for responsible proficient.

PSO 2. Capability to follow careers in IT industry, research and development, consultancy, teaching and core regions related to Information technologies.

PSO 3. Improve capability to design and conduct experiments, and interpret data

PSO 4. To understand, explore and build up programming in the areas of Algorithms, Artificial Intelligence, System Software, Networking and Security, Multimedia, Web Design and Big Data Analytics for effective project of computer-based systems.

PSO 5. Improve capability to use current technologies, skills and models for computing practice.

COURSE OUTCOMES

Programming Languages:

CO1: Prepare object-oriented design for small/medium scale problems.

CO2: Demonstrate the differences between traditional imperative design and object-oriented design.

CO3: Explain class structures as fundamental, modular building blocks.

CO4: Understand the role of inheritance, polymorphism structures in building code.

CO5: Acquire knowledge of using classes written by other programmers when constructing their systems.

Advanced Database Management Systems:

CO1: Express the basic concepts of DBMS and RDBMS.

CO2: Apply normalization theory to the normalization of a database

CO3: Apply the concept of Transaction Management & Recovery techniques in RDBMS.

CO4: Analyze various advanced databases prevailing in market, Big Data, Temporal Databases, Parallel and Distributed Databases, XML Database and multidimensional Databases

CO5: Demonstrate No SQL databases (Open Source)

Data Communication and Networks

CO1: Understand basic computer network technology.

CO2: Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.

CO3: Describe routing and congestion in network layer with routing algorithms and classify IPV4 addressing scheme. CO5: Discuss the elements and protocols of transport layer

T. JOHN COLLEGE
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Programme Name: Master of Computer Applications

Paper Code: 1MCA1 **Core paper 1: THE ART OF COMPUTER PROGRAMMING**			
Semester **I**	**Hours / Week** **4**	**Total hours** **52**	**Credits**

Course Objectives

1. To impart adequate knowledge on the need of programming languages and problem solving techniques.
2. To develop an in-depth understanding of functional and logical concepts of C Programming.
3. To provide exposure to problem-solving through C programming.
4. To familiarize the basic syntax and semantics of C Language

Course Outcomes

CO1: Describe the basics of computer and understand the problem solving aspect.
Co2: Demonstrate the algorithm and flow chart for the given problem.
CO3: Design and develop C program to evaluate simple expressions and logical operations.
CO4: Develop & Implement C programs with suitable modules to solve the given problem.
CO5: Demonstrate the concept of pointer and perform I/O operations in files.
CO6: Design and develop solutions to real world problems using C.

Paper Code: 1MCA2 **Core paper 2:** Discrete Mathematics			
Semester **I**	**Hours / Week** **4**	**Total hours** **52**	**Credits**

Course Objectives:

1. Use logical notation and perform logical proofs
2. Determine equivalent logic expressions
3. Use graphs and trees

4. Apply basic and advanced principles of counting
5. Define sets and sequences
6. Calculate discrete probabilities.

Course Outcomes

CO1: Identify sets, different properties of sets, set operations and set identities.
CO2: Explain the different methods for representing the relationship between sets.
CO3: The basic concepts involving functions needed in discrete mathematics.
CO4: Discuss how the equivalence classes of an equivalence relation partition a set into disjoint nonempty subsets.
CO5: Use logical notation and perform logical proofs.

Paper Code: 1MCA3 **Core paper 3: COMPUTER ORGANIZATION AND ARCHITECTURE**			
Semester **I**	**Hours / Week** **4**	**Total hours** **52**	**Credits**

Course Objective

1. To educate the basics of computer hardware and how software interacts with computer hardware.
2. To familiarize with different numbering methods like binary, octal, and hexadecimal.
3. To impart the knowledge of buses, I/O devices, flip flops, Memory and bus structure.
4. To understand the concepts of memory hierarchy and compare different methods for computer architecture.

Course Outcomes:

CO1: Remember basic structure of computer and numbering methods like binary, octal and hexadecimal and explain how arithmetic and logical operations are performed by computers.
CO2: Understand various data transfer techniques in digital computer and control unit operations.
CO3: Apply performance issues in processor and memory design of a digital computer various data representations.
CO4: Analyze architectures and computational designs and computer architecture concepts related to design of modern processors, memories and I/Os.

Paper Code: 1MCA4 **Core paper 4: THEORY OF COMPUTATION**			
Semester **I**	**Hours / Week** **4**	**Total hours** **52**	**Credits**

Course Objectives:

1. To give an overview of the theoretical foundations of computer science from the perspective of formal languages
2. To illustrate finite state machines to solve problems in computing
3. To explain the hierarchy of problems arising in the computer sciences.
4. To familiarize Regular grammars, context frees grammar.

Course Outcomes:

CO1: To use basic concepts of formal languages of finite automata techniques
CO2: To Design Finite Automata's for different Regular Expressions and Languages
CO3: To Construct context free grammar for various languages
CO4: To solve various problems of applying normal form techniques, push down automata and turing Machines
CO5: To participate in GATE, PGECET and other competitive examinations

Paper Code: 1MCA5 **Core paper 5: OBJECT ORIENTED PROGRAMMING**			
Semester **I**	**Hours / Week** **4**	**Total hours** **52**	**Credits**

Course Objectives:

1. Gain knowledge about basic Java language syntax and semantics to write Java programs and use concepts such as variables, conditional and iterative execution methods etc.
2. Understand the fundamentals of object-oriented programming in Java, including managing classes, objects, invoking methods etc and exception handling mechanisms.
3. Concepts of inheritance, packages, interfaces and multithreading are introduced.

Course Outcomes:

CO1: Remember the fundamentals of programming such as variables, conditional statements and iterative execution statements.
CO2: Understand the concepts of arrays, strings, packages and multithreading.
CO3: Analyze the concepts of applet programming, graphics programming and files.
CO4: Create a software application using the Java programming language

Paper Code: 1MCA6 **Core paper 6: DATA STRUCTURES**			
Semester **I**	**Hours / Week** **4**	**Total hours** **52**	**Credits**

Course Objectives:

1. To educate the concepts of fundamentals of writing algorithms and approach in problem solving.
2. To represent the basic concepts of stack, queue, linked list, trees and graphs.
3. To understand the concepts of searching and sorting techniques.

Course Outcomes:

CO1: Remember the concepts of algorithms for searching, sorting and dynamic programming.
CO2: Understand the representations of data and various algorithm
CO3: Apply appropriate algorithms and data structures for real time applications.
CO4: Analyze the complexity of different algorithms

Paper Code: 1MCA7 **Core paper 7: DATA STRUCTURES LAB PROGRAMS**			
Semester **I**	**Hours / Week** **8**	**Total hours**	**Credits**

Course Objectives

1. To develop skills to design and analyze simple linear and non linear data structures.
2. It strengthen the ability to the students to identify and apply the suitable data structure for the given real world problem.
3. It enables them to gain knowledge in practical applications of data structures.

Course Outcomes:

CO1: Be able to design and analyze the time and space efficiency of the data structure
CO2: Be capable to identity the appropriate data structure for given problem
CO3: Have practical knowledge on the applications of data structures

Paper Code: 1MCA8 **Core paper 8: OBJECT ORIENTED PROGRAMMING WITH JAVA LAB**			
Semester **I**	**Hours / Week** **8**	**Total hours**	**Credits**

Course Objective:

1. This course introduces computer programming using the JAVA programming language with object-oriented programming principles.
2. Emphasis is placed on event-driven programming methods, including creating and manipulating objects, classes, graphics concepts, applet programming concepts etc.,
3. Upon completion, students should be able to design, code and debug JAVA language programs.

Course Outcomes

CO1: Remember the fundamentals of Java programming language
CO2: Understand the basics of Java programming, multi-threaded programs and Exception handling

CO3: Analyze and use Java in a variety of applications.
CO4: Write and debug a software application developed using the Java programming language.

Paper Code: 2MCA1 **Core paper 9: OPERATING SYSTEMS**			
Semester **II**	**Hours / Week** **4**	**Total hours** **52**	**Credits**

Course Objectives:
1. Students will gain knowledge of basic operating system concepts.
2. To have an in-depth understanding of process concepts, deadlock and memory management.
3. To provide an exposure to scheduling algorithms, devices and information management.
4. Students will familiarize on the general structure of an operating system and case study is also provided.

Course Outcomes:
CO1: Remember the basic concepts of operating system
CO2: Understand the concepts like interrupts, deadlock, and memory management and file management.
CO3: Analyze the need for scheduling algorithms.
CO4: Implement different algorithms used for representation, scheduling, allocation in DOS and UNIX operating system.

Paper Code: 2MCA2 **Core paper 10: DATABASE MANAGEMENT SYSTEMS**			
Semester **II**	**Hours / Week** **4**	**Total hours** **52**	**Credits**

Course Objectives
1. To grasp the different issues involved in the design of a database system.
2. To study the physical and logical database designs and database modeling like relational, hierarchical, and network models.
3. To understand essential DBMS concepts such as: database security, integrity and normalization.
4. To design and build a simple database system and demonstrate competence with the fundamental tasks involved with modeling and designing a DBMS.

Course Outcomes:
CO1: Define data independence, data models for database systems, database schema and database instances.
CO2: Understand and use data manipulation language to query and manage a database.

CO3: Analyze and design a real database application.
CO4: Apply normalization concepts for designing a good database with integrity constraints.

Paper Code: 2MCA3 **Core paper 11: COMPUTER NETWORKS**			
Semester **II**	**Hours / Week** **4**	**Total hours** **52**	**Credits**

Course Objectives:
1. To educate the concepts of terminology and concepts of the OSI reference model and the TCP/IP reference model and protocols such as TCP, UDP and IP.
2. To be familiar with the concepts of protocols, network interfaces, and esign/performance issues in local area networks and wide area networks.
3. Introduce the student to a network routing for IP networks and how a collision occurs and how to solve it and how a frame is created and character count of each frame.

Course Outcomes:
CO1: Remember the organization of computer networks, factors influencing computer network development and the reasons for having variety of different types of networks.
CO2: Understand Internet structure and can see how standard problems are solved and the use of cryptography and network security
CO3: Apply knowledge of different techniques of error detection and correction to detect and solve error bit during data transmission.
CO4: Analyze the requirements for a given organizational structure and select the most appropriate networking architecture and technologies.

Paper Code: 2MCA4 **Core paper 12: SOFTWARE ENGINEERING**			
Semester **II**	**Hours / Week** **4**	**Total hours** **52**	**Credits**

Course Objectives
1. To understand the overview of Software Project Characteristics and software management.
2. To familiarize with the different methods and techniques used in project management.
3. To understand and reduce the failure issues of software projects.
4. To learn how effectively the project scheduling, risk analysis, quality management and project cost estimation can be implemented using various techniques.

Course Outcomes:

CO1: Analyze the fundamentals of project management and compare different software engineering process models
CO2: Understand various concepts involved in project management, project planning and project scheduling.
CO3: Analyze project risks, monitor and track project deadlines and produce a work plan and resource schedule.
CO4: Apply the project management tools and techniques in a diversity of fields that include new product and process development, construction, information technology, and applied research.

Paper Code: 2MCA5
Core paper 13: THE DESIGN AND ANALYSIS OF ALGORITHM

Semester	Hours / Week	Total hours	Credits
II	4	52	

Course Objectives:

1. Analyze the asymptotic performance of algorithms.
2. Write rigorous correctness proofs for algorithms.
3. Demonstrate a familiarity with major algorithms and data structures.
4. Apply important algorithmic design paradigms and methods of analysis.
5. Synthesize efficient algorithms in common engineering design situations.

Course Outcomes:
CO1: Argue the correctness of algorithms using inductive proofs and invariants.
CO2: Analyze worst-case running times of algorithms using asymptotic analysis.
CO3: Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it.. Synthesize divide-and-conquer algorithms. Derive and solve recurrences describing the performance of divide-and-conquer algorithms.
CO4: Describe the greedy paradigm and explain when an algorithmic design situation calls for it. Synthesize greedy algorithms, and analyze them.
CO5: Explain the major graph algorithms and their analyses. Employ graphs to model engineering problems, when appropriate. Synthesize new graph algorithms and algorithms that employ graph computations as key components, and analyze them.
CO6: Analyze randomized algorithms. Employ indicator random variables and linearity of expectation to perform the analyses. Recite analyses of algorithms that employ this method of analysis.
CO7: Compare between different data structures. Pick an appropriate data structure for a design situation.
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Paper Code: 2MCA6
Core paper 14: ARTIFICIAL INTELLIGENCE

Semester	Hours / Week	Total hours	Credits
II	4	52	

Course Objectives

1. To understand the basic concepts of Artificial Intelligence (AI) and identify the AI problems and domains.
2. To provide search techniques to solve the problems.
3. To represent and access the domain specific knowledge.

Course Outcomes:

CO1: Understand the nature of AI problems and task domains of AI.
CO2: Apply the appropriate search procedures to solve the problems by using best algorithms.
CO3: Analyze and select the suitable knowledge representation method.
CO4: Manipulate the acquired knowledge and infer new knowledge
CO5: Demonstrate the development of AI systems by encoding the knowledge.

Paper Code: 2MCA 7 **Core paper 15: DATABASE MANAGEMENT SYSTEMS LAB**			
Semester **II**	**Hours / Week** **8**	**Total hours**	**Credits**

Course Objectives:

1. To understand the practical applicability of database management system concepts.
2. Working on existing database systems, designing of database, creating relational database, analysis of table design.

Course Outcomes:

CO1: Students get practical knowledge on designing and creating relational database systems.
CO2: Understand various advanced queries execution such as relational constraints, joins, set operations, aggregate functions, trigger views and embedded SQL.
CO3: Use of various software to design and build ER Diagrams, UML, Flow chart for related database systems.
CO4: Students will be able to design and implement database applications on their own

Paper Code: 2MCA 8 **Core paper 16: UNIX PROGRAMMING LAB**			
Semester **II**	**Hours / Week** **8**	**Total hours**	**Credits**

Course Objectives:

1. Basic understanding of UNIX OS, UNIX commands and File system
2. To familiarize students with the Linux environment.

3. To make student learn fundamentals of shell scripting and shell programming.
4. Emphases are on making student familiar with UNIX environment and issues related to it.

Course Outcomes:

CO1: To execute the various UNIX commands on a standard UNIX/LINUX Operating system
CO2: Able to do shell programming on UNIX OS.
CO3: Able to understand and handle UNIX system calls.

Paper Code: 4**MCA 1** **Core paper 17: Project**			
Semester **IV**	**Hours / Week**	**Total hours**	**Credits**

Course Objectives

1. To understand and select the task based on their core skills.
2. To get the knowledge about analytical skill for solving the selected task.
3. To get confidence for implementing the task and solving the real time problems.

Course Outcomes:

CO1: Identify and formulate the problem
CO2: Analyse the problem and collect necessary data.
CO3: Design and develop the project using appropriate software by applying the programming skills.
CO4: Implement, evaluate and generate reports.