

Department of Master Of Computer Application
Netaji Subhash Engineering College

COURSE OUTCOMES (COs)

Program Name: Master of Computer Application

FIRST YEAR : 1ST SEMESTER		
Course Name (Code)	Course Outcomes (COs)	
	On completion of the course, the students will be able to:	
MCA101 Computer Organization & Architecture	CO1	Ability to understand basic structure of computer
	CO2	Ability to perform computer arithmetic operations
	CO3	Ability to understand control unit operations.
	CO4	Ability to design memory organization that uses banks for different word size operations.
	CO5	Ability to understand the concept of cache mapping techniques
	CO6	Ability to understand the concept of I/O organization
	CO7	Ability to conceptualize instruction level parallelism
MCA102 Business Systems and Applications	CO1	Explain to students why information systems are so important today for business and management;
	CO2	Evaluate the role of the major types of information systems in a business environment and their relationship to each other;
	CO3	Assess the impact of the Internet and Internet technology on business electronic commerce and electronic business;
	CO4	Identify the major management challenges to building and using information systems and learn how to find appropriate solutions to those challenges
	CO5	Define an IT infrastructure and describe its components;
	CO6	Learn the core activities in the systems development process;
	CO7	Cultivate skills and experience in the development and implementation of information systems projects.
	CO1	

MCA103 Computer Programming with C		Understand the basic terminology used in computer programming
	CO2	Formulate the problem and design the algorithm to solve the problem .
	CO3	Demonstrate how to Write, compile and debug programs in C language.
	CO4	Understand different data types in C language.
	CO5	Design programs involving decision structures, loops and functions.
	CO6	Design program involving the concept of array
	CO7	Understand the concept of Pointer and design program involving the concept of Pointer.
	CO8	Understand the concept of structure and design program involving the concept of Structure.
	CO9	Implement an application that uses the concept of File.
MM101 Discrete Mathematical Structure	CO1	Interpret and analyse the mathematical procedure/rules in physical or other terms to see what it practically means and applies. (Relations, Lattice and Fuzzy sets)
	CO2	Combinatorics (mathematical induction, Propositional calculus and Permutation- combinations and recurrence relations)
	CO3	Construct and conversion of automata and design a grammar.
	CO4	Able to Apply the knowledge, concepts and techniques in graph theory to solve problems.
MCA191 Micro Programming & Architecture Lab	CO1	Perform conversions among different number systems, became familiar with basic logic gates and understand Boolean algebra and simplify simple Boolean functions by using basic Boolean properties & design of combinational circuits such as MUX, DEMUX, Encoder and Decoder etc.
	CO2	Understand the design of sequential Circuits such as Flip-Flops, Registers, and Counters. Obtain a basic level of Digital Electronics knowledge and set the stage to perform the analysis and design of Complex Digital electronic Circuits.
	CO3	Provide practical hands-on experience with microprocessor applications and interfacing techniques.
	CO4	Understand 8085 microprocessor kit, knowledge of 8085 instruction set and ability to utilize it in assembly language programming.
	CO5	Understand real mode Memory addressing and ability to interface various devices to the microprocessor.
MCA193 Programming lab (C)	CO1	Formulate the problem and design the algorithm to solve the problem
	CO2	Demonstrate how to Write, compile and debug programs in C language
	CO3	Understand different data types in C language.
	CO4	Design programs involving decision structures, loops and functions.
	CO5	Design program involving the concept of array.
	CO6	Design program involving the concept of Pointer.
	CO7	Design program involving the concept of Structure
	CO8	Implement an application that uses the concept of File.
FIRST YEAR : 2ND SEMESTER		

MCA201 Data Communication & Computer Networks	CO1	Build an understanding of the fundamental concepts of computer networking.
	CO2	Familiarize the student with the basic taxonomy and terminology of the computer networking area.
	CO3	Introduce the student to advanced networking concepts, preparing the student for entry Advanced courses in computer networking.
	CO4	Allow the student to gain expertise in some specific areas of networking such as the design and maintenance of individual networks.
MCA202 Information Systems Analysis & Design	CO1	Able to analyze and implement different software development process models
	CO2	Able to analyze software requirements specifications for different projects and develop some basic level of software architecture/design.
	CO3	Able to understand the basic concepts and importance of software project management concepts like cost estimation, scheduling and reviewing the progress.
	CO4	Able to identify and implement software matrices and apply different testing and debugging techniques and analyzing their effectiveness.
MCA203 Data Structures with C	CO1	To access how the choices of data structure & algorithm methods impact the performance of program.
	CO2	To Solve problems based upon different data structure & also write programs.
	CO3	Choose an appropriate data structure for a particular problem.
MCA204 Data Base Management System I	CO1	Differentiate database systems from file systems, describe each in both function and benefit. Define the terminology, features, classifications, and characteristics embodied in database systems.
	CO2	Understanding the basic structure of Database and recognize the different views of the database.
	CO3	Demonstrate an understanding of the data model and analyze the data expressed in the form of different data model.
	CO4	Solve broad range of query problems by formulating query using Query language i.e. Relational Algebra, Tuple Calculous, Domain Calculous and SQL and Optimize the query.
	CO5	Demonstrate an understanding of Functional Dependency, normalization theory and apply such knowledge to the normalization of a database.
	CO6	Analyze the data storage structure like Sequential, Index Sequential, Hashing and B+ tree structure.
MCA205 Object-Oriented Programming With C++	CO1	Understanding the principles of object-oriented programming that includes concepts of Class, Objects, Abstraction, Encapsulation, Information Hiding, Inheritance, and Polymorphism i.e. features of OOPs. Difference between Structured Programming and Object Oriented Programming.
	CO2	Analyze the problems and programming issues such as Class, Object etc
	CO3	Implement the software by using the OOPS concept i.e. Operator Overloading, Function Overloading, Inheritance and Polymorphism.
	CO4	Understanding the concepts of file handling and streams. In addition,

		Implement the software by using File and templates to make code reusable.
MCA293 Data structure lab	CO1	Know about the basic concepts of Function, Array and Link-list
	CO2	Understand how several fundamental algorithms work particularly those concerned with Stack, Queues, Trees and various Sorting algorithms
	CO3	Design new algorithms or modify existing ones for new applications and able to analyze the space & time efficiency of most algorithms.
MCA294 Database lab	CO1	Understand, analyze and apply common SQL statements including DDL, DML and DCL statements to perform different operations.
	CO2	Design different views of tables for different users and to apply embedded and nested queries.
	CO3	Design and implement a database for a given problem according to well known design principles that balance data retrieval performance with data consistency.
MCA295 Object-Oriented Programming lab (C++)	CO1	Be able to explain the difference between object oriented programming and procedural programming
	CO2	CO2:Be able to program using more advanced C++ features such as □ composition of objects, Operator overloads, dynamic memory allocation, Inheritance and polymorphism, file I/O, exception handling, etc.
	CO3	Be able to build C++ classes using appropriate encapsulation and design□ principles.
SECOND YEAR : 3RD SEMESTER		
MCA301 Operating Systems and Systems Software	CO1	Understand the difference between different types of modern operating systems, virtual machines and their structure of implementation and applications.
	CO2	Analyze difference between process & thread, issues of scheduling algorithm. Design locks, semaphores, monitors, message for synchronizing and communicating multiprogramming system
	CO3	Understanding the concepts of deadlock in operating systems and design algorithm for how they can be managed / avoided and implement them in multiprogramming system.
	CO4	Design Memory management concepts along with issues and challenges of main memory, virtual memory and file system.
	CO5	Understanding the types of I/O management, disk scheduling, protection and security problems faced by operating systems and how to minimize these problems.
	CO6	Analyze the security issues and design the algorithm for cryptography and application. CO7: Understanding the basic concept of Assembler, Linker- loader, Compiler.

MCA302 Unix and Shell Programming	CO1	Understand the Unix Operating System and the working of the built in commands available in unix.
	CO2	Analyze the working of the user defined commands and will be able change the permissions associated with files.
	CO3	Explain the concept of Shell and the different usage of the commands in shell.
	CO4	Write program in AWK language
	CO5	Identify and analyze various shell scripts and administrator privileges.
MCA303 Intelligent Systems	CO1	Able to learn the basics of the theory and practice of Artificial Intelligence as a discipline about intelligent agents capable of deciding what to do, and do it.
	CO2	Able to understand, find appropriate idealizations for converting real world problems into AI search problems formulated using the appropriate search algorithm.
	CO3	Able to design good evaluation functions and strategies for game playing and implementing different search problems based on time and space complexities for standard search algorithms.
	CO4	Ability to apply knowledge representation techniques for problem solving and analyze various applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.
	CO5	The student will build self-learning and research skills to be able to tackle a topic of interest on his/her own or as part of a team.
MM301 Statistics and Numerical Techniques	CO1	Basic Statistics, Probability theory and Curve fitting with application.
	CO2	Sources of error of numerical methods.
	CO3	Simple polynomial interpolation and evaluating the numerical integration
	CO4	Solving the system of linear equations and algebraic equation.
	CO5	Solving the first order ordinary differential equation
MCA392 Unix lab	CO1	Student will be able to run various UNIX commands on a standard UNIX/LINU Operating system.
	CO2	Student will be able to learn data extraction using various commands (grep, sed, awk) on UNIX.
	CO3	Student will be able to do shell programming on UNIX OS.
	CO4	Student will be able to understand and handle UNIX system calls.
MM 391 Statistics and Numerical Analysis Lab	CO1	Flowchart, algorithm and C/C++ coding of mean, median, mode and curve fitting
	CO2	Flowchart, algorithm and C/C++ coding of interpolation methods
	CO3	Flowchart, algorithm and C/C++ coding of numerical integration
	CO4	Flowchart, algorithm and C/C++ coding to solve the system of linear equations and algebraic equation.
	CO5	Flowchart, algorithm and C/C++ coding to solving the first order ordinary differential equation.

SECOND YEAR : 4TH SEMESTER

MCA401 Software Engineering & TQM	CO1	How to apply the software engineering lifecycle by demonstrating competence in communication, planning, analysis, design, construction, and deployment
	CO2	An ability to work in one or more significant application domains
	CO3	Work as an individual and as part of a multidisciplinary team to develop and deliver quality software
	CO4	Demonstrate an understanding of and apply current theories, models, and techniques that provide a basis for the software lifecycle
	CO5	Demonstrate an ability to use the techniques and tools necessary for engineering practice
MCA402 Graphics & Multimedia	CO1	To provide comprehensive introduction about computer graphics system, design algorithms and two dimensional transformations.
	CO2	To make the students familiar with techniques of clipping, three dimensional graphics and three dimensional transformations
	CO3	The computer graphics course prepares students for activities involving in design, development and testing of modeling, rendering, shading and animation.
MCA403 Data Base Management System II	CO1	Able to understand, appreciate and can effectively explain the importance of DBMS and Database Management Tools
	CO2	Able to implement a database schema for a given problem domain. Apply the normalization process to produce a relation into an ultimate normal form.
	CO3	Able to analyze different database management tools and the typical problems that can occur when multiple users process a database concurrently and able to describe specific design and implementation strategies for improving database security
	CO4	Able to develop Oracle Database Objects- Procedures, Functions, Packages.
MM401 Operation Research & Optimisation Techniques	CO1	Formulate and Find optimum solution of the linear models using simplex, Big-M, graphical methods.
	CO2	Solve specific allocation problems using Transportation and Assignment models and determine a game to think strategically to solve many situations
	CO3	Design and Solve the problems on project management using PERT-CPM and calculate the shortest path using different algorithm.
	CO4	Describe the basic queuing system configurations
	CO5	Estimate the optimum inventory level of an industry
	CO6	Solve the sequencing and dynamic programming problem

MCA491 Software Project Management lab	CO1	Learn the software life cycle phases (project management, requirements engineering, software design, prototyping and testing).
	CO2	Create and specify a software design based on the requirement specification that the software can be implemented based on the design.
	CO3	Get familiar with modeling language for analysis and design.
	CO4	Make a testing plan for the software.
	CO5	Will be able to do the Project Scheduling, tracking, Risk analysis, Quality management and Project Cost estimation using different techniques
MCA492 Graphics & Multimedia Lab	CO1	Understand and explain the mathematical and theoretical principles of computer graphics eg: To draw basic objects like lines, triangles and polygons using opengl built-in functions
	CO2	Use matrix algebra in computer graphics and implement fundamental algorithms and transformations involved in viewing models
	CO3	Write basic but complete graphics software systems projection models, illumination models and handling of hidden surfaces and clipping in computer graphics
	CO4	Analyze and evaluate the use of computer graphics methods in practical applications and describe effects such as texture mapping, bump mapping and antialiasing
	CO5	Apply computer graphics techniques to creating aesthetic effect
MCA493 Advanced Database lab	CO1	Populate and query a database using SQL DML/DDL commands. Design different views of tables for different users and to apply embedded and nested queries.
	CO2	Design and implement a database for a given problem according to well known design principles that balance data retrieval performance with data consistency. Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS
	CO3	Programming PL/SQL including stored procedures, stored functions, cursors, packages.
THIRD YEAR : 5TH SEMESTER		
MCA E502B Windows Programming With VB	CO1	Design, create, build, and debug Visual Basic applications.
	CO2	Write and apply decision structures for determining different operations
	CO3	Create one and two dimensional arrays for sorting, calculating, and displaying of data.
	CO4	Write Visual Basic programs using object-oriented programming techniques including classes, objects, methods, instance variables, composition, and inheritance, and polymorphism
	CO5	Write Windows applications using forms, controls, and events

MCA E503B Object Oriented Programming With Java	CO1	To understand the concept of object-oriented development, and create a static object model and a dynamic behavioural model and a functional model of the system.
	CO2	To understand the approaches to system design and object design, and the techniques of translating design to implementation
	CO3	To implement the object-oriented modelling and design patterns to provide solutions to the real-world software
MCA E504B E- Commerce	CO1	Able to understand the foundations and importance of E-commerce
	CO2	Able to understand and analyze retailing in E-commerce by analyzing branding and pricing strategies, impact of E-commerce on business models and strategy and principles of E-commerce and basics of World Wide Web as well as the concept of electronic data interchange and its legal, social and technical aspects
	CO3	Able to understand and analyze the security issues over the web, the available solutions and future aspects of e-commerce security and the concept of E-banking, electronic payment system.
	CO4	Able to evaluate the role of the major types of information systems in a business environment and their relationship to each other. Assess the impact of the Internet and Internet technology on business electronic commerce and electronic business and identification of the major management challenges to building and using information systems and learn how to find appropriate solutions to those challenges.
MCA E501A Distributed database management	CO1	Understanding the distributed DBMS features and needs, reference architecture and level of distribution.
	CO2	Design fragmentation, replication allocation .
	CO3	Analyze distributed concurrency control protocol-2 phase locking,timestamp and quorum based protocol, distributed deadlock.
	CO4	Understanding the reliability issue and design non-blocking commitment protocol
	CO5	Design the Global Query to Fragment Query and optimize the Query
	CO6	Understanding of Advanced Database System
MCA E592B Windows Programming Lab	CO1	Understand various features of VB to solve various computing problems
	CO2	Analyze a given problem and implement an algorithm to solve the problem
	CO3	Implement the Visual Basic language constructs in the right way
	CO4	Design, develop and test Applications written in Visual Basic.
MCA591 Minor project and seminar	CO1	Provides opportunity for students to develop skills in presentation and discussion of research topics in a public forum.
	CO2	Provides students with exposure to a variety of research projects and activities in order to enrich their academic experience
	CO3	To understand the programming language concepts and basics of Software Development Life Cycle model for the implementation of the project
	CO4	To plan, analyze, design and implement a software project using SDLC

		model. learn to work as a team and to focus on getting a working project done within a stipulated period of time.
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FOURTH YEAR : 7TH SEMESTER		
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