DEPARTMENT OF MASTERS OF COMPUTER APPLICATIONS

2022 SCHEME COURSE OUTCOMES

Course Name	Course Code	CO. No.	Course Outcomes
MATHEMATICAL FOUNDATION FOR COMPUTER APPLICATIONS	22MCA11	C01	Apply the fundamentals of set theory and matrices for the given problem.
		C02	Apply the types of distribution, evaluate the mean and variance for the given case study/ L3 problem.
		C03	Solve the given problem by applying the Mathematical logic concepts.
		C04	Model the given problem by applying the concepts of graph theory.
		C05	Design strategy using gaming theory concepts for the given problem.
		C06	Identify and list the different applications of discrete mathematical concepts in computer science.
OPERATING SYSTEM CONCEPTS	22MCA12	C01	Analyse the basic Operating System Structure and concept of Process Management
		C02	Analyse the given Synchronization/ Deadlock problem to solve and arrive at valid conclusions
		C03	Analyse OS management techniques and identify the possible modifications for the given problem context
		C04	Ability to design and solve synchronization problems.
		C05	Ability to simulate and implement operating system concepts such as scheduling, Deadlock management, file management, and memory management.
DATA STRUCTURES WITH ALGORITHMS	22MCA13	C01	Explore different data structures, its operations..
		C02	Demonstrate the concept of recursion and Queue.
		C03	Apply the concept of Linked list, Trees and Graphs in problem solving
		C04	Implement all data structures in a high-level language for problem solving
COMPUTER NETWORKS	22MCA14	C01	Apply the basic concepts of networks like protocol, internet and OSI layers
		C02	Analyze the working of Physical Layer.
		C03	Demonstrate the various Switching networks
		C04	Analyze the Data Link Layer
DESIGN AND ANALYSIS OF	22MCA15	C01	Describe the basic algorithm design strategies and use them for devising new solutions to various problems

ALGORITHMS		C02	Analyse algorithms for time/space complexity
		C03	Differentiate between deterministic and probabilistic algorithms and use the probabilistic algorithms in appropriate scenarios
DATA STRUCTURES WITH ALGORITHMS LABORATORY	22MCA6	C01	Implement the techniques for evaluating the given expression.
		C02	Implement sorting / searching techniques, and validate input/output for the given problem.
		C03	Implement data structures (namely Stacks, Queues, Circular Queues, Linked Lists, and Trees), its operations and algorithms.
		C04	Implement the algorithm to find whether the given graph is connected or not and conclude on the performance of the technique implemented.
COMPUTER NETWORKS LABORATORY	22MCA7	C01	Implement data link layer farming methods.
		C02	Analyze error detection and error correction codes.
		C03	Implement and analyze routing and congestion issues in network design.
		C04	Implement Encoding and Decoding techniques used in presentation layer.
		C05	To be able to work with different network tools.
RESEARCH METHODOLOGY AND IPR	22RMI18	C01	Identify the suitable research methods and articulate the research steps in a proper sequence for the given problem.
		C02	Explain the functions of the literature review in research, carrying out a literature search, developing theoretical and conceptual frameworks and writing a review.
		C03	Explain various research designs, sampling designs, measurement and scaling techniques
		C04	Perform the data collection from various sources segregate the primary and secondary L3 data.
		C05	Apply some concepts/section of Copy Right Act /Patent Act /Cyber Law/ Trademark to L3 the given case and develop –conclusions
BASICS OF PROGRAMMING & CO	22MCA110	C01	Demonstrate the key concepts introduced in C programming by writing and L3 executing the programs.
		C02	Demonstrate the concepts of structures and pointers for the given application/problem.
		C03	Implement the single/multi-dimensional array for the given problem.
		C04	Demonstrate the application of logic gates in solving some societal/industrial problems.
		C05	Analyse how memory organization, operations, instruction sequencing and interrupts are L3 useful in

			executing the given program.
DATABASE MANAGEMENT SYSTEM	22MCA21	C01	Identify, analyze and define database objects, enforce integrity constraints on a database using RDBMS
		C02	Use Structured Query Language (SQL) for database manipulation and also demonstrate the basic of query evaluation.
		C03	Design and build simple database systems and relate the concept of transaction, concurrency control and recovery in database
		C04	Develop application to interact with databases, relational algebra expression.
		C05	Develop applications using tuple and domain relation expression from queries.
OBJECT ORIENTED PROGRAMMING USING JAVA	22MCA22	C01	Use object oriented programming concepts to solve real world problems.
		C02	Explain the concept of class and objects with access control to represent real world entities
		C03	Describe the concept of interface and abstract classes to define generic classes.
		C04	Demonstrate the implementation of inheritance (multilevel, hierarchical and multiple) by using extend and implement keywords.
		C05	Demonstrate the user defined exceptions by exception handling keywords (try, catch, throw, throws and finally)
		C06	Understand the process of graphical user interface design and implementation using AWT or swings.
		C07	Use different layouts (Flow Layout, Boarder Layout, Grid Layout, Card Layout) to position the controls for developing graphical user interface.
SOFTWARE ENGINEERING	22MCA23	C01	Design a software system, component or process to meet desired needs within realistic constraints
		C02	Assess professional and ethical responsibility
		C03	Function on multi-disciplinary teams
		C04	Use the techniques, skills, and modern engineering tools necessary for engineering practice
		C05	Analyze, design, implement, verify, validate, implement, apply, and maintain software systems or parts of software systems
WEB TECHNOLOGIES	22MCA24	C01	Apply the features JQuery for the given web based problem
		C02	Demonstrate the development of XHTML documents using JavaScript and CSS.
		C03	Illustrate the use of CGI and Perl programs for different types of server side applications.

		C04	Design and implement user interactive dynamic web based applications
		C05	Demonstrate applications of Angular JS and JQuery for the given problem.
		C06	Learning and Developing XHTML documents using JavaScript and CSS.
		C07	Learning and Developing XHTML documents using JavaScript and CSS.
DATA MINING AND BUSINESS INTELLIGENCE	22MCA252	C01	Analyse the concept of data warehouse, Business Intelligence and OLAP.
		C02	Demonstrate data pre-processing techniques and application of association rule mining Algorithms.
		C03	Apply various classification algorithms and evaluation of classifiers for the given Problem.
		C04	Analyse data mining for various business intelligence applications for the given problem.
		C05	Apply classification and regression techniques for the given problem.
COMPUTER GRAPHICS WITH OPEN GL	22MCA251	C01	Design and implement algorithms for 2D graphics primitives and attributes.
		C02	Illustrate Geometric transformations on both 2D and 3D objects.
		C03	Un derstand the concepts of clipping and visible surface detection in 2D and 3D viewing, and Illumination Models.
		C04	Discuss about suitable hardware and software for developing graphics packages using OpenGL
ENTERPRISE RESOURCE PLANNING	22MCA253	C01	Analyse the essentials of supply chain management in ERP
		C02	Analyse the implementation of ERP in the context of business of the different organization
		C03	Analyse and apply ERP for different business modules for the given problem.
		C04	Analyse the given case study of ERP marketing.
		C05	Analyse the design of ERP with future E-commerce and internet.
USER INTERFACE DESIGN	22MCA254	C01	Analyse the new technologies that provide interactive devices and interfaces.
		C02	Apply the guidelines to develop the UID and evaluate for the given problem.
		C03	Apply the development methodologies with an analysis of the social impact and legal issues Understand Direct Manipulation and Virtual Environment
		C04	Discuss the command, natural languages and issues in design for maintaining QoS
		C05	Demonstrate techniques for information search and

			visualization for the given problem
CRYPTOGRAPHY AND NETWORK SECURITY	22MCA261	C01	Analyze and design classical encryption techniques and block ciphers
		C02	Understand and analyze data encryption standard.
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		C04	Understand key management and distribution schemes and design User Authentication, such as Diffie-Hellman Key Exchange, ElGamal Cryptosystem, etc
		C05	Analyze and design hash and MAC algorithms, and digital signatures
DBMS LABORATORY	22MCA7	C01	Create database objects.
		C02	Design entity-relationship diagrams to solve given database applications.
		C03	Implement a database schema for a given problem
		C04	Formulate SQL queries in Oracle for the given problem.
		C05	Apply normalization techniques to improve the database design for the given problem.
		C06	Build database and verify for its appropriate normalization for any given problem
USER INTERFACE DESIGN	22MCA254	C01	Analyse the new technologies that provide interactive devices and interfaces.
		C02	Apply the guidelines to develop the UID and evaluate for the given problem.
		C03	Apply the development methodologies with an analysis of the social impact and legal issues Understand Direct Manipulation and Virtual Environment
		C04	Discuss the command, natural languages and issues in design for maintaining QoS
		C05	Demonstrate techniques for information search and visualization for the given problem
USER INTERFACE DESIGN	22MCA254	C01	Recall the theoretical foundations of various issues related to linear programming modeling to formulate real-world problems as a L P model
		C02	Explain the theoretical workings of the graphical, simplex and analytical methods for making effective decision on variables so as to optimize the objective function.
		C03	Identify appropriate optimization method to solve complex problems involved in various industries.
		C04	Demonstrate the optimized material distribution schedule using transportation model to minimize total distribution cost.
		C05	Explain the theoretical workings of sequencing techniques for effective scheduling of jobs on machines.
CRYPTOGRAPHY AND	22MCA261	C01	Analyze and design classical encryption techniques and block ciphers

NETWORK SECURITY		C02	Understand and analyze data encryption standard.
		C03	Understand and analyze public-key cryptography, RSA and other public-key cryptosystems
		C04	Understand key management and distribution schemes and design User Authentication, such as Diffie-Hellman Key Exchange, ElGamal Cryptosystem, etc
		C05	Analyze and design hash and MAC algorithms, and digital signatures
JAVA PROGRAMMING LABORATORY	22MCA8	C01	Demonstrate the fundamental data types and constructs of Java Programming by writing executable/interpretable programs.
		C02	Illustrate the object oriented principles with the help of java programs
		C03	Develop reusable and efficient applications using inheritance concepts of java.
		C04	Learn the object oriented concepts and its implementation in Java.
PYTHON	22MCA31	CO1	Understand and comprehend the basics of Python programming.
		CO2	Apply knowledge in real time applications
		CO3	Apply the Data Pre-processing & Data Wrapping
		CO4	Demonstrate the Web Scraping And Numerical Analysis
INTERNET OF THINGS	22MCA32	CO1	Analyse the IoT architecture and design along with functional/compute stack and data management.
		CO2	Apply IOT architecture for a given problem.
		CO3	Analyse the application protocol, transport layer methods for the given business case.
		CO4	Analyse the application of data analytics for IOT for a given.
		CO5	Analyse the architecture and develop programming using modern tools for the given use case
CLOUD COMPUTING	22MCA332	CO1	Demonstrate the fundamental and core concepts of cloud computing
		CO2	Compare between parallel and distributed computing
		CO3	Investigate the system virtualization and outline its role in enabling the cloud computing system model
		CO4	Compare different deployment and service models of cloud to develop different variety of applications
NOSQL	22MCA335	CO1	Analyse and Manage the Data using CRUD operations
		CO2	Apply and Develop the applications using NoSQL
		CO3	Realize the concept of Map Reduce its applicability in the real world application development
		CO4	Apply the framework of NOSQL to find the solutions

PROJECT WORK PHASE – 1	22MCAL35	CO1	Demonstrate a sound technical knowledge of their selected project topic.
		CO2	Undertake problem identification, formulation, and solution.
		CO3	Communicate with engineers and the community at large in written an oral forms
		CO4	Demonstrate the knowledge, skills and attitudes of a professional engineer
DATA ANALYTICS LAB WITH MINI-PROJECT	22MCAL36	CO1	Apply object-oriented programming concepts to develop dynamic interactive Python Applications.
		CO2	Use the procedural statements: assignments, conditional statements, loops, method calls and arrays
		CO3	Design, code, and test small Python programs with a basic understanding of top-down Design.
		CO4	Learn how to create GUI and solve real-world problem using language idioms, data structures and standard library
IOT LABORATORY WITH MINI PROJECT	22MCAL37	CO1	Design and develop an application for the given problem for the societal/industrial problems
		CO2	Develop python program by applying suitable feature for the given problem and verify the output
		CO3	Build intruder system that sends an alert to the given email
SOCIETAL PROJECT	22MCAL38	CO1	Building solution for real life societal problems.
		CO2	Improvement of their technical/curriculum skills
INTERNSHIP	22MCA39	CO1	Gain practical experience within industry in which the internship is done.
		CO2	Acquire knowledge of the industry in which the internship is done.
		CO3	Apply knowledge and skills learned to classroom work.
		CO4	Develop a greater understanding about career options while more clearly defining personal career goals.
		CO5	Experience the activities and functions of professionals.
		CO6	Identify areas for future knowledge and skill development.
		CO7	Expand intellectual capacity, credibility, judgment, intuition.
		CO8	Acquire the knowledge of administration, marketing, finance and economics.
SOFTWARE PROJECT MANAGEMENT	22MCA414	CO1	Apply theoretical concepts for projects management
		CO2	Planning for resources allocation with case studies.
		CO3	Solving problems related to risk identification, cost based analysis, etc.
		CO4	Managing and working in team
SEMANTIC WEB & SOCIAL	22MCA422	CO1	Summarize to create ontology and knowledge representation for the semantic web

NETWORK		CO2	Solve to build a blogs and social networks
		CO3	Describe the Modeling and aggregating social network data.
		CO4	Illustrate the Web- based social network and Ontology
AGILE TECHNOLOGIES	22MCA424	CO1	Illustrate the working of Agile Methods, XP
		CO2	Explain the concept of Coding Standards, Iteration Demo, Reporting
		CO3	Demonstrate Incremental requirements, Customer Tests, Test-Driven Development,
		CO4	Evaluate how to Build Effective Relationships (can be attained through assignment or CIE)
PROJECT PHASE 2	22MCA44	CO1	Present the project and be able to defend it
		CO2	Make links across different areas of knowledge and to generate, develop and evaluate ideas and information so as to apply these skills to the project task.
		CO3	Habituated to critical thinking and use problem solving skills.
		CO4	Communicate effectively and to present ideas clearly and coherently in both the written and oral forms.
		CO5	Work in a team to achieve common goal.
		CO6	Learn on their own, reflect on their learning and take appropriate actions to improve it.