DEPARTMENT OF MCA
R23

The vision of CBIT : "To be the enter of excellence in technical education and research".

The mission of CBIT : "To address the emerging needs through quality technical education and advanced research".

The Vision of the MCA Department:
To become a premier center in the field of Computer Applications that produces innovative, skillful and socially responsible professionals who can contribute significantly to academics, research and industry.

The Mission of the MCA Department:

1. To empower students with state-of-the-art technologies in Computer Science and its Applications to meet global needs.
2. To develop technical expertise in Computer Applications through collaborative learning and innovation.
3. To encourage lifelong learning, social responsibility, professionalism and ethical practices in addressing real-world challenges.

Programme Educational Objectives of the MCA Department:
Graduates will

PEO 1: Possess a strong foundation in Computer Science Applications, demonstrating proficiency in programming languages, software development and other core areas.

PEO 2: Excel in career by exhibiting societal consciousness, creativity and technical competency in emerging areas of computer applications

PEO3: Demonstrate a commitment to professional and social responsibility while applying computational thinking, adapting to industry demands, and undertaking professional development activities

Programme Outcomes of the MCA Department
After completion of two year MCA course, the students will be able to:

PO 1. Apply mathematical foundations and concepts of Computer Science to meet the Industry requirements.
PO 2. Analyze, design and investigate complex problems to formulate solutions using domain knowledge with emerging tools and technologies.
PO 3. Develop creative applications with acquired skills to become Information Technology professional.
PO 4. Communicate effectively with diverse teams.
PO 5. Recognize societal needs and develop solutions with professional ethics.
PO 6. Acquire the software project management skills, lifelong learning, career enhancement and to adopt in different professional environment.

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Chaitanya Bharathi Institute of Technology
Gandipet, Hyderabad-500 075, Telan

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY
With effect from 2023-24
MCA (Master of Computer Applications)

SNO	Code	Course	Course Outcomes
1	23MCC101	Data Structures	1. After completion of the course, students would be able to: Understand the basic concepts of C++, build classes with functions, constructors and apply OOPS concepts wherever required. 2. Make use of various linear data structures and their implementation according to situations. 3. Apply and Distinguish different sorting techniques and their implementation in real world environment. 4. Implement different collision resolution techniques on hashing. 5. Make use of various non-linear data structures and their implementation according to situations
2	23MCC102	Computer Architecture	1. After completion of the course, students would be able to: Identify the operations and utilities of Boolean algebra and K Maps 2. Evaluate the working of Registers and types of Computer instructions 3. Learn the basic computer organization and its design. 4. Classify the operations of CPU and their functionality. 5. Appreciate the input–output, memory organization and concepts of parallel processing.
3	23MCC103	Object-oriented programming using Java	After completion of the course, students would be able to: 1. Explain conceptual and practical knowledge of basic Object-Oriented Programming concepts. 2. 2. Develop complex Object-Oriented Programs using distinct OOP principles, apply knowledge of interfaces, packages 3. 3. Develop exception handling mechanism and multithreading. 4. 4. Apply knowledge of string handling, string buffer, and string builder.

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			5. Identify the importance of the Collections framework, Stream API to develop complex applications with advanced Data Structures
4	23MTC103	Mathematical Foundation for Computer Science	After completion of the course, students would be able to: 1. Understand the required propositional logic to test the logic of a program. 2. Examine various properties of Relations and Functions. 3. Identify the basics of Linear Algebra in the form of Matrices and Vectors. 4. Expose the principle of Inclusion and Exclusion as a basis for various Permutations and Combinations. 5. Evaluate the procedural knowledge on Graphs and Trees to derive applications in Computer
5	23MTC104	Probability and Statistics for Data Science	After completion of the course, students would be able to: 1. To discuss the skewness and kurtosis. 2. To explain the concept of random variable and mathematical expectation. 3. To explain hypothetical data using probability distribution. 4. To discuss the testing of hypothesis of sample data. 5. To explain the concept and computation of regression curves
6	23MCC104	Data Structures Lab	After completion of the course, students would be able to: 1. Build classes with member functions, constructors and destructors. 2. Analyze the different kinds of inheritance types and its functionalities. 3. Make use of various linear data structures concepts in real world environment. 4. Apply and distinguish different sorting techniques and their requirement according to the situations. 5. Implement different collision resolution techniques on hashing. 5. Distinguish the

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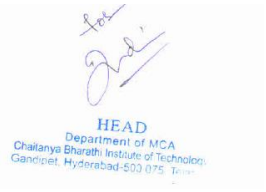
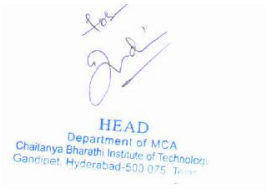
			DFS and BFS of graph traversals and their implementations.
7	23MCC105	Java Lab	After completion of the course, students would be able to: 1. Demonstrate and model various mathematical computation programs using OOP concepts. 2. Conclude the restrictions on class members using package-level access protection. 3. Apply the forecasting of multiple clients' task execution using Multithreading and exception-handling concepts. 4. Analyze the input as well as output data for String and Stream programming. 5. Identify the usage of Collections framework, Lambda Expressions, and Stream API
8	23EG101	Professional Communication Skills Lab	After completion of the course, students would be able to: 1. Differentiate various soft skills and build an impressive personality. 2. Draft cover letter, Résumé, e-mail, minutes of the meeting, memos and SoP effectively. 3. Deliver effective presentations in professional contexts confidently. 4. Participate in Group discussions and resolve issues proficiently. 5. Face interviews successfully.
9	23MCC106	Database Management Systems	After completion of the course, students would be able to: 1. Acquire the knowledge of the basic concepts of the database. 2. Create the data models. Map ER models into Relations and normalize the relations 3. Impart the knowledge of query evaluation, data storage and accessing. 4. Gain the concepts of concurrent execution and transaction management. 5. Analyze the issues in system crash and recovery measures



10	23MCC107	Web Technologies	After completion of the course, students would be able to: 1. Develop web pages using HTML 5. 2. Apply CSS concepts to present the document. 3. Perform client-side validations and create interactive web pages using JavaScript. 4. Create XML documents. 5. Build an application using React JS
11	23MCC108	Python Programming	After completion of the course, students would be able to: 1. Read, write, execute by hand simple Python programs. 2. Decompose a Python program into functions. 3. Represent compound data using Python lists, tuples, and dictionaries. 4. Read and write data from/to files in Python Programs 5. Handling exceptions and understanding GUI programs
12	23MCC109	Operating Systems	After completion of the course, students would be able to: 1. Understand the fundamental components of a computer operating system and the interactions among them. 2. Analyze the CPU scheduling algorithms, threading models, Build applications using semaphores and monitors to synchronize their operations. 3. Illustrate the deadlock handling methods, Memory management Techniques, analyze the performance of CPU scheduling and page replacement algorithms. 4. Implement File System concepts, analyze the disk scheduling algorithms and RAID Levels. 5. Illustrate the I/O System Concepts, analyze the System Security and System Protection
13	23MCE101	Design and Analysis of Algorithms	After completion of the course, students would be able to:



			1. Analyze the time and space complexities of algorithms. 2. Explain different algorithmic design techniques. 3. Apply important algorithmic design paradigms. 4. Analyze complex problems to find out optimal solutions. 5. Design and Analyze non deterministic algorithms to solve polynomial and non-polynomial problems.
14	23MCE102	Business Intelligence and Analytics	After completion of the course, students would be able to: 1. Get clear idea about the basic concepts on Business Analytics in an organization. 2. Identify detailed knowledge about the role of Business Analysts in decision making. 3. Distinguish between Descriptive, Predictive and Prescriptive Analytics. 4. Gain knowledge on Data Warehousing and Data Mining concepts. 5. Analyze the usefulness of Business analytics in various functional areas of an organization along with features of big data and its implications.
15	23MCE103	Free and Open Source Technologies	After completion of the course, students would be able to: 1. Identify various FOSS tools, platforms, licensing procedures and development models, ethics 2. Describe various FOSS projects, development models and project management 3. Adapt to the usage of FOSS tools and technologies. 4. Distinguish between Proprietary and Open Source tools, development methods 5. Practice Open Source principles, ethics and models and Evaluate various Open Source projects like Linux, Apache, GIT

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16	23MCE104	Optimization Techniques	After completion of the course, students would be able to: 1. Basic methods, principles in optimization. 2. Formulation of optimization models, solution methods in optimization. 3. Finding initial basic feasible solutions. 4. Methods of linear and non-linear (constrained and unconstrained) programming. 5. Applications to engineering problems.
17	23MCC110	Database Management Systems Lab	After completion of the course, students would be able to: 1. Implement SQL commands. 2. Declare and enforce integrity constraints on a database. 3. Build the views with multiple options. 4. Develop PL/SQL programs using stored procedures, functions, cursors and packages. 5. Create user access and authorization controls.
18	23MCC111	Web Technologies Lab	After completion of the course, students would be able to: 1. Develop static web pages. 2. Present the documents in professional way. 3. Construct interactive web pages. 4. Perform client side validations. 5. Build web applications using React JS.
19	23MCC112	Operating Systems Lab	After completion of the course, students would be able to: 1. Implement basic shell programs 2. Build programs on process scheduling algorithms 3. Implement programs on Inter process Communication. 4. Build programs on synchronization problems 5. Implement programs on files

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20	23MCC113	Artificial Intelligence and Machine Learning	After completion of the course, students would be able to: 1. Differentiate between elementary Problem and AI problem. 2. Determine and evaluate the various problem solving strategies. 3. Determine and evaluate the various search strategies. 4. Learning various supervised machine learning algorithms 5. Learning Clustering techniques
21	23MCC114	Software Engineering	After completion of the course, students would be able to: 1. Identify the basics of software engineering principles and importance of software Requirements specification. 2. Acquire the knowledge and requirement of software development models. 3. Classify the importance of software design and architecture principles and models. 4. Acquaint with the software testing approaches and levels of testing 5. Analyze the concepts of risk management, software reengineering, reverse engineering and software maintenance activities
22	23MCC115	Data Communications & Computer Networks	After completion of the course, students would be able to: 1. Interpret the various features of Data Communications and understand the functions of different layers of ISO model. 2. Analyze the various protocols and Access methods of Data Link layer and MAC sub Layers. 3. Experiment With various Routing Algorithms of Network layer. 4. Apply Transport layer Services and protocols such as TCP, UDP. 5. Evaluate internals of main protocols such as HTTP, FTP, SMTP and DNS services of Application layer and security issues in computer networking
23	23MCE105	Cloud Computing	After completion of the course, students would be able to: 1. Identify the basic components of cloud computing and resource sharing 2. Assess the deployment & delivery models in cloud environment to support the client's requirements.

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			3. Appreciate various cloud infrastructure mechanisms, virtual server's role and utility to the need of the hour. 4. Evaluate the role, design and implementation of various cloud architectures to provide the best services. 5. Analyze the role and functionalities of IaaS, PaaS, SaaS services from consumers perspective
24	23MCE106	Big Data Analytics	After completion of the course, students would be able to: 1. Outline the fundamentals of various big data analytics techniques. 2. Analyze the Map-Reduce programming model for better optimization 3. Develop applications using the Map Reduce framework to solve real-world problems 4. Develop data models using NoSQL Database - MongoDB. 5. Experiment with Big Data applications using Pig and Hive
25	23MCE107	Distributed Application Development	After completion of the course, students would be able to: 1. Understand the database connectivity and application servers. 2. Explore the type of forms with validations using React JS. 3. Utilize Express framework to develop responsive web applications. 4. Demonstrate the architecture and file system of Node Js. 5. Identify the significance of component intercommunication with Angular2.

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26	23MCE108	Social Network Analysis	After completion of the course, students would be able to: 1. Understand the basic concepts of social networks 2. Understand the various Ranking Algorithms 3. Understand the fundamental concepts in analysing the large-scale data that are derived from social networks 4. Implement mining algorithms for social networks 5. Perform mining on large social networks and illustrate the results
27	23MEO201	Intellectual Property Rights	After completion of the course, students would be able to: 1. Understand the evolution of IP, working of organization's at global level to protect and promote IP. 2. Familiarize with the patent filing process at national and international level. 3. Draw the logical conclusion of research, innovation and patent filing. 4. Compare different kinds of IP and their patenting system. 5. Understand the techno-legal-business angle of IP, infringement and enforcement mechanisms for protection
28	23MBO104	Organizational Behavior	After completion of the course, students would be able to: 1. Analyze the behaviour, perception and personality of individuals and groups in organizations in terms of the key factors that influence organizational behaviour. 2. Assess the potential effects of organizational-level factors on organizational behaviour. 3. Critically evaluate the potential effects of motivating and leading the individuals in the Organization. 4. Analyze organizational behavioural issues in the context of groups, communication. 5. Develop strategies to deal with power, politics and conflict issues at workplace
29	23MEO202	Human Values and Professional Ethics	After completion of the course, students would be able to: 1. State basic values and the need for value education.

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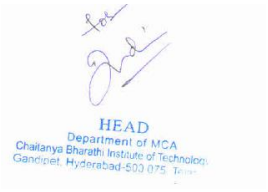
			2. Analyze the situation and prioritize values for making right decisions in their personal as well as professional life. 3. Understand the role of a human being in ensuring harmony in society and nature. 4. Demonstrate the knowledge of ethics at their work place and apply different theoretical approaches to solve ethical dilemmas. 5. Apply risk and safety measures in the engineering practice.
30	23CEO102	Disaster Control and Response	After completion of the course, students would be able to: 1. Analyze and critically examine existing programs in disaster management regarding vulnerability, risk and capacity at different levels 2. Understand and choose the appropriate activities and tools and set up priorities to build a coherent and adapted disaster management plan 3. Understand various mechanisms and consequences of human induced disasters for the participatory role of engineers in disaster management 4. Understand the impact on various elements affected by the disaster and to suggest and apply appropriate measures for the same 5. Develop an awareness of the chronological phases of disaster preparedness, response and relief operations for formulating effective disaster management plans and ability to understand various participatory approaches/strategies and their application in disaster management
31	23MCC116	Machine Learning Lab using Python	After completion of the course, students would be able to: 1. Practice the basic programs using python 2. Demonstrate proficiency in handling loops and creation of functions. 3. Identify the methods to create and manipulate lists, tuples and dictionaries. 4. Implementation of supervised machine learning algorithms 5. Implementation of clustering oriented algorithms
32	23MCC117	Unified Modeling	After completion of the course, students would be able to:



		Language (UML) Lab	1. Learn the browsing and 4 views of Rational Rose case tool. 2. Gained the knowledge of selecting a case study and implement visual modeling 3. Model use case diagram and class diagram with all 6 relations and able to design boundary, control, entity classes 4. Implement the structural modeling through collaboration diagram, Dynamic modelling through sequence diagram, State diagram, Activity diagram 5. Establish the system's architecture through the modelling of component diagram and able to model the overall system's hardware, networking and software implementation through the deployment diagram.
33	23MCC118	Technical Seminar	After completion of the course, students would be able to: 1. Conduct a independent technical study and survey on the selected technical topic. 2. Understand the importance & impact of the subject in software industry 3. Appreciate the relevance of the topic in modern day scenario 4. Learn the practical applicability of the features & functionalities of the topic 5. Deliver a speech and presentation of the study topic in front of the class and evaluating faculties.
34	23MCC119	Internship	After completion of the course, students would be able to: 1. Conduct an independent feasibility study and survey on the selected technical domain. 2. Appreciate the industry point of view on the identified technical subject. 3. Analyze the requirement specifications. 4. Identify all the modules , interfaces , and implement the code 5. Present the technical documentation of the internship
35	23MCE109	Cyber Security	After completion of the course, students would be able to: 1. Identify different types of cybercrimes and analyze legal frameworks to deal with these cybercrimes. 2. Apply Tools used in cybercrimes and laws governing cyberspace. 3. Infer the features of Cryptography and Network Security. 4. Interpret the Cyber Laws and use them accordingly.

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			5. Identify the importance of digital evidence in prosecution.
36	23MCE110	Soft Computing	After completion of the course, students would be able to: 1. Elaborate the Evolutionary Computing. 2. Applications of Feedforward Neural Network 3. Summarize the uses of Associative Memory and Unsupervised Learning 4. Analyze the Classical Sets and Fuzzy Sets 5. Perform various operations on Rough Sets
37	23MCE111	Block Chain Technology	After completion of the course, students would be able to: 1. Identify the basic concepts , architecture , Ecosystem of Block chain 2. Understand the various operations & transactions of Block chain 3. Appreciate the security concepts , Encryption mechanisms & cybersecurity challenges 4. Evaluate the role, and process of Bitcoin concepts 5. Analyze the role and functionalities of Block chain in modern-day scenario along with application of Block chain landscapes
38	23MCE112	Deep Learning	After completion of the course, students would be able to: 1. Identify Suitable Neural Networks. 2. Optimization of Deep Models 3. Apply Convolutional Neural Networks on real world problems 4. Apply Sequence Modeling 5. Formulate Deep Learning Research
39	23MCE113	Cyber Forensics	After completion of the course, students would be able to: 1. Implement the need and principles of digital forensics. 2. Summarize various digital investigation process models. 3. Illustration about digital forensic tools. 4. Obtain and analyze digital information for possible use as evidence in digital forensics process. 5. Applying forensic science to computers and networks.

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40	23MCE114	Internet of Things	After completion of the course, students would be able to: 1. Explain vision of IoT from a global context. 2. Demonstrate the Architectural Overview of IoT. 3. Explain the usage of Devices, Gateways and Data Management in IoT. 4. Interpret state of the art architecture in IoT and Design Constraints 5. Analyze the domain Specific Applications
41	23MCE115	Explainable Artificial Intelligence	After completion of the course, students would be able to: 1. Develop an understanding of Quantifying uncertainty and probabilistic reasoning 2. Making a simple decisions on the basis of utility theory 3. Learning how to take complex decision and learning from examples. 4. Knowing knowledge in learning and learning various probabilistic models. 5. Understanding various reinforcement learning algorithms.
42	23MCE116	Natural Language Processing	After completion of the course, students would be able to: 1. Explain the basic concepts of the Natural language processing pipeline and applications of NLP. 2. Illustrate various text representation techniques in NLP. 3. Analyze text classification techniques and deep learning basics to process natural language text. 4. Outline text summarization methods and example systems. 5. Demonstrate levels of NLP for several case studies & apply NLP Pipelines to solve real-world applications.
43	23MCC120	PROJECT WORK	After completion of the course, students would be able to: 1. Understand to capture project requirements from the client. 2. Analyze and implement software life cycle for the given requirements. 3. Design a real time solution for the given software requirement specifications. 4. Develop the solution for the chosen problem using the concepts and techniques in the curriculum. 5. Writes test cases and applies test case scenarios and record the entire development process.

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DEPARTMENT OF MCA
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The Vision of the MCA Department:
To become a premier center in the field of Computer Applications that produces innovative, skillful and socially responsible professionals who can contribute significantly to academics, research and industry.

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Programme Outcomes of the MCA Department

After completion of two year MCA course, the students will be able to:

PO 1. Apply mathematical foundations and concepts of Computer Science to meet the Industry requirements.

PO 2. Analyze, design and investigate complex problems to formulate solutions using domain knowledge with emerging tools and technologies.

PO 3. Develop creative applications with acquired skills to become Information Technology professional.

PO 4. Communicate effectively with diverse teams.

PO 5. Recognize societal needs and develop solutions with professional ethics.

PO 6. Acquire the software project management skills, lifelong learning, career enhancement and to adopt in different professional environment.

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CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY
With effect from 2020-21
MCA (Master of Computer Applications)

SEMESTER – I

S.No	Course Code	Title of the Course	Course Outcomes
1	20MCC101	Computer Programming using 'C'	After completion of the course, the students will be able to 1. Design algorithms and draw flowcharts for various problems. 2. Choose various data types which are suitable for the problems and distinguish the concepts of control structures. 3. Develop programs using functions and preprocessor directives. 4. Apply array and pointer concepts in solving various problems. 5. Utilize the concepts of strings and structures in various problems. 6. Build programs by using dynamic memory allocation and file management concepts.
2	20MCC102	Computer Organization and Architecture	After completion of the course, the students will be able to: 1. Acquaint with the operations and utilities of Boolean algebra and K Maps 2. Evaluate the work implementation of digital components, sequential and combinational circuits. 3. Learn the basic computer organization and its design. 4. Understand the components of CPU and their functionality. 5. Appreciate the input–output and memory organization. 6. Analyze Parallel processing concepts and its applicability.

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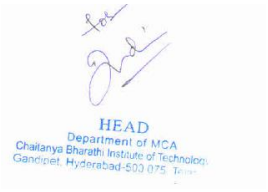
3	20MCC103	Software Engineering	After completion of the course, the students will be able to: 1. Understand the basics of software engineering principles and importance of software requirement's specification. 2. Acquire the knowledge and requirement of software development models. 3. Identify the importance of software design and architecture principles and models. 4. Acquaint with the software testing approaches and levels of testing 5. Learn the concepts of risk management, software reengineering, reverse engineering and software maintenance activities.
4	20MCC104	Mathematical Foundations for Computer Applications	After completion of the course the students will be able to: 1. Understand the required propositional logic to test the logic of a program. 2. Examine various properties of Relations and Functions. 3. Identify the basics of Linear Algebra in the form of Matrices and Vectors. 4. Synthesize the importance of minimization and Least Squares in data analysis and fitting. 5. Expose the principle of Inclusion and Exclusion as a basis for various Permutations and Combinations. 6. Evaluate the procedural knowledge on Graphs and Trees to derive applications in Computer Science.
5	20MTC27	Probability& Statistics	On successful completion of this course the students shall be able to 1. Calculate the measures of skewness. 2. Apply probability on continuous and discrete random variables. 3. Use the basic probability for fitting



			the Random phenomenon. 4. Apply various tests for testing the significance of sample data. 5. Use the principle of Least Squares approximation for estimation of the data.
6	20MCC105	Computer Programming Lab using 'C'	After completion of the course, the students will be able to: 1. Use various data types, operators and control structures in the programs. 2. Apply the built-in functions and customized functions for solving the programs. 3. Develop the programs using one-dimensional and two-dimensional array concepts. 4. Build the programs using pointer concepts. 5. Construct the Programs using strings and structures concepts. 6. Solve the problems using dynamic memory allocation and file management concepts.
7	20MCC106	Python Programming Lab	After completion of the course, student will be able to: 1. Understand basic types of Python Programming. 2. Demonstrate the conditional and loop statements in Python Programming. 3. Experiment with functions and recursive functions. 4. Elaborate various operations on Strings, Lists, Tuples, Dictionaries. 5. Understand and experiment with libraries like Numpy, Pandas, matplotlib. 6. Demonstrating the Data Pre-Processing techniques.
8	20EG101	Professional Communication in English Lab	After successful completion of the course the students will be able to: 1. Define the speech sounds in English and understand the

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			nuances of pronunciation in English 2. Apply stress correctly and speak with the proper tone, intonation and rhythm. 3. Differentiate various soft skills and illustrate proper email and mobile etiquette. 4. Determine the context, work in teams, discuss and participate in Group discussions and demonstrate effective presentation skills. 5. Design a resume and prepare and face interviews with confidence.

SEMESTER-II

S.No	Course Code	Title of the Course	Course Outcomes
1	20MCC107	Data Structures and Algorithms	After completion of the course, students would be able to: 1. Understand the basic concepts of C++. 2. Build classes with functions, constructors and apply OOPS concepts wherever required. 3. Make use of various linear data structures and their implementation according to situations. 4. Apply and Distinguish different sorting techniques and their implementation in real world environment. 5. Implement different collision resolution techniques on hashing. 6. Make use of various non-linear data structures and their implementation according to situations
2	20MCC108	Artificial Intelligence	1. After completion of the course, students will be able to: 2. Differentiate between elementary Problem and AI problem. 3. Determine and evaluate the

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			various search strategies. 4. Compare and contrast the various knowledge representation schemes in AI. 5. Understand and analyze the various reasoning techniques involved in solving AI problems. 6. Understand the different learning techniques.
3	20MCC109	Object Oriented Programming using Java	After completion of the course, the students will be able to: 1. Gain the conceptual and practical knowledge on basic Object-Oriented Programming concepts. 2. Implement complex Object-Oriented Programs using distinct OOP principles. 3. Acquire the knowledge on Scheduling of real-time application clients using Thread models as well as Exception Handling mechanisms. 4. Evaluate the usage of Mutable and Immutable Strings in different systems development. Also inculcate basic Stream Programming 5. Identify the importance of Collections framework to develop complex applications with advanced Data Structures. 6. Design and practice the GUI Components and to habituate the Event driven programming.
4	20MCC110	Database Management Systems	After the completion of the course, students will be able to: 1. Acquire the knowledge of basic concepts of the database. 2. Exposure to different Data Models. 3. Map the ER Models into relations and normalize the relations. 4. Acquire the knowledge of query evaluation. 5. Gain the knowledge of concurrent execution and transaction management.

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			6. Understand the issues in system crash and recovery measures.
5	20MCE101	Organizational Behavior. Elective – I	After completion of this course students would be able to: 1. Analyze the behavior, perception and personality of individuals and groups in organizations in terms of the key factors that influence organizational behavior. 2. Analyze the various characteristics of the perceiver, target and situation 3. Assess the potential effects of organizational-level factors on organizational behavior. 4. Critically evaluate the potential effects of motivating and leading the individuals in the Organization. 5. Analyze organizational behavioral issues in the context of groups, power and politics issues. 6. Understanding various conflict resolution strategies.
	20MCE102	Entrepreneurship. Elective – I	After completion of the course, students will be able to: 1. Apply the entrepreneurial process. 2. Analyze the feasibility of a new business venture and preparation of Business plan. 3. Ability to evaluate entrepreneurial tendency and attitude. 4. Brainstorm ideas for new and innovative products or services. 5. Use a variety of feasibility studies, assess and select prospective new venture concepts. 6. Describe how to investigate financing alternatives for specific new venture concepts.

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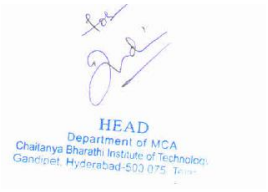
	20MCE103	Business Intelligence & Analytics. Elective – I	After completion of the course, the students will be able to: 1. Get clear idea about the basic concepts on Business Analytics in an organization. 2. Demonstrate detailed knowledge about the role of Business Analysts in decision making. 3. Distinguish between Descriptive, Predictive and Prescriptive Analytics. 4. Gain knowledge on Data Warehousing and Data Mining concepts. 5. Understand the usefulness of Business analytics in various functional areas of an organization. 6. Identify the key features of Big data and its implications.
	20MCE104	Software Project Management. Elective – I	After completion of the course, the students will be able to: 1. Gain basic knowledge of software project management principles. 2. Choose an appropriate project development model. 3. Implement design patterns in the software architecture. 4. Identify project risks, monitor and track project deadlines. 5. Work in a team environment and be aware of different models of communications. 6. List various process models and describe issues related with quality assurance.
6	20MCC111	Data Structures Lab using C++	After completion of the course, students will be able to: 1. Build classes with member functions, constructors and destructors. 2. Analyze the different kinds of inheritance types and its functionalities. 3. Make use of various linear data structures concepts in real world environment.



			4. Apply and distinguish different sorting techniques and their requirement according to the situations. 5. Implement different collision resolution techniques on hashing. 6. Distinguish the DFS and BFS of graph traversals and their implementations. -
7	20MCC112	Object Oriented Programming Lab using Java	After completion of the course, students will be able to: 1. Understand and model various mathematical computation programs using OOP concepts. 2. Conclude the restrictions on class members using package level access protection. 3. Implement the forecasting of multiple clients task execution using Multithreading and exception handling concepts. 4. Analyze the input as well as output data for String and Stream programming. 5. Determine the usage of Collections framework with the help of its interfaces and classes. 6. Apply Event handling using distinct Layout managers.
8	20MCC113	Database Management Systems Lab	After completion of the course, the student will be able to: 1. Implement SQL commands. 2. Declare and enforce integrity constraints on a database. 3. Implement the views with multiple options. 4. Develop PL/SQL programs using stored procedures, functions, cursorsand packages. 5. Create user access and authorization controls. 6. Design and build a Forms and Reports.

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SEMESTER - III

S.No	Course Code	Title of the Course	Course Outcomes
1	20MCC114	Data Communications and Computer Networks	After completion of the course, the students will be able to: 1. Interpret the various features of Data Communications. 2. Demonstrate proper placement of different layers of ISO model and illuminate its function. 3. Analyze the various protocols and Access methods of Data Link layer an MAC sub Layers. 4. Experiment With various Routing Algorithms of Network layer. 5. Apply Transport layer Services and protocols such as TCP, UDP. 6. Identify internals of main protocols such as HTTP, FTP, SMTP and DNS service of Application layer and security issues in computer networking.
2	20MCC115	Data Science and Machine Learning	After completion of the course, the students will be able to: 1. Identify Suitable Machine Learning algorithms for different problems. 2. Preprocess the data sets. 3. Apply Prediction Techniques. 4. Recognize patterns using Machine Learning models. 5. Apply dimensionality reduction techniques on different datasets. 6. Create ensemble methods for optimization.
3	20MCC116	Operating Systems	After completion of the course, the students will be able to: 1. Define the fundamental components of a computer operating system and the interactions among them.

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			2. Illustrate CPU scheduling algorithms, memory management techniques and deadlock handling methods. 3. Build applications using semaphores and monitors to synchronize their operations. 4. Analyze the performance of CPU scheduling and page replacement algorithms. 5. Identify how the process management, scheduling, memory management happen in Linux Environment.
4	20MCC117	Web Technologies	After completion of the course, the students will be able to: 1. Develop the web pages using XHTML/HTML. 2. Apply CSS concepts to present the document. 3. Perform client side validations using Javascript 4. Create interactive web pages using JavaScript and jQuery. 5. Develop the web applications using PHP and MYSQL. 6. Store and transport the data using XML.
5	20MCE105	Cloud Computing Elective-II	After completion of the course, the students will be able to: 1. Identify the basic components of cloud computing for service perspective and their roles. 2. Understand the requirement of various technologies offered in cloud environment to support the client's requirements. 3. Appreciate various cloud infrastructure mechanisms, virtual server's role and utility to the need of the hour. 4. Evaluate the role, design and implementation of various cloud architectures to provide the best services. 5. Will be able to analyze the

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			role and functionalities of IaaS, PaaS, SaaS service infrastructure mechanisms 6. Apply large data processing methods in Clouds.
	20MCE106	Design and Analysis of Algorithms Elective-II	After completion of the course, the students will be able to: 1. Analyze the time and space complexities of algorithms. 2. Understand different algorithmic design techniques. 3. Apply important algorithmic design paradigms. 4. Analyze complex problems to find out optimal solutions. 5. Design and Analyze non deterministic algorithms to solve polynomial and non-polynomial problems.
	20MCE107	Big Data Analytics Elective-II	After completion of the course, students will be able to: 1. Explain the foundations, definitions, and challenges of Big Data and various Analytical tools. 2. Understand the HADOOP architecture. 3. Design program using HADOOP and Map reduce. 4. Understand importance of Big Data in Social Media and Mining. 5. Understand Data Analytics with R. 6. Compare supervised and unsupervised learning.
	20MCE108	Advanced Java Programming Elective-II	After completion of the course, the students will be able to: 1. Understand the architecture of JAVA EE. 2. Examine the JDBC driver connection to Oracle, MySQL databases. 3. Design and build a web application using servlets. 4. Develop web application using JSPs. 5. Compares Model 1 and MVC architecture using servlets and JSPs.

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			6. Apply and Build Struts based application using MVC Architecture.
6	20MCA101	Intellectual Property rights and Professional Ethics.	After completion of the course, students will be able to: 1. Understand about the importance of Ownership, patent rights and its licensing. 2. Summarize about Patent Infringement and patent laws. 3. Identify the new developments and government laws in patenting. 4. Understand the importance of Values and Ethics in their personal lives and professional careers. 5. Learn the rights and responsibilities as an employee, team member and as a global citizen. Understand about the engineering experimentation and challanges
7	20MCC118	Object Oriented System Development Lab	After completion of the course the students will be able to: 1. Understood the browsing and 4 views of Rational Rose case tool. 2. Gained the knowledge of selecting a case study and modelling it using nine UML diagrams 3. Acquainted with the knowledge of implementing and modelling use case diagram and class diagram with all 6 relations and the elements of use cases, actors, boundary, control and entity classes and object message modelling. 4. Implement the structural modeling of through collaboration diagram and Dynamic modelling through sequence diagram. 5. Develop and model state diagram to establish of a given object's life cycle and also

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			construct activity diagram modelling to appreciate the parallel object flows in the system's implementation. 6. Establish the system's architecture through the modelling of component diagram. Able to understand the overall system's hardware and software implementation through the modelling of deployment diagram. -
8	20MCC119	Machine Learning Lab using Python	After completion of course, the students will be able to: 1. Understand complexity of Machine Learning algorithms and their limitations; 2. Understand modern notions in data analysis oriented computing; 3. Be capable of confidently applying common Machine Learning algorithms in practice and implementing their own 4. Be capable of performing experiments in Machine Learning using real-world data. -
9	20MCC120	Web Technologies Lab	After completion of the course, the students will be able to: 1. Develop static web pages. 2. Present the documents in professional way. 3. Construct interactive web pages. 4. Perform client side validations. 5. Build web applications. 6. Store and Transport data using XML. -

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SEMESTER - IV

S.No	Course Code	Title of the Course	Course Outcomes
1	20MCE109	Cyber Security Elective-III	After completion of the course, the students will be able to: 1. Identify different types of cybercrimes and analyze legal frameworks to deal with these cybercrimes. 2. Apply Tools used in cybercrimes and laws governing cyberspace. 3. Infer the features of Cryptography and Network Security. 4. Interpret the Cyber Laws and use them accordingly. 5. Identify the importance of digital evidence in prosecution. 6. Analyze and resolve cyber security issues.
	20MCE110	Social Network Analysis Elective-III	1. Understand the basic concepts of social networks 2. Understand the various Ranking Algorithms 3. Understand the fundamental concepts in analyzing the large-scale data that are derived from social networks 4. Implement mining algorithms for social networks 5. Perform mining on large social networks and illustrate the results. 6. Analysis of various opinions on social networks
	20MCE111	Block Chain Technology Elective-III	After completion of the course, students will be able to: 1. Design principles of Bitcoin and Ethereum. 2. Explain the Simplified Payment Verification protocol. 3. List and describe differences between proof-of-work and proof-of-stake consensus. 4. Experiment with a blockchain system by sending and reading transactions. 5. Design, build, and deploy a distributed application. 6. Evaluate security, privacy, and efficiency of a given blockchain system.

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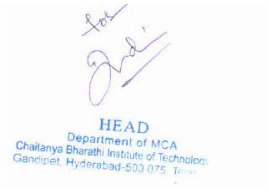
	20MCE112	Deep Learning Elective-III	After completion of the course the students will be able to: 1. Identify Suitable Neural Networks. 2. Train Neural Networks. 3. Find Local Minima for Optimization of Models. 4. Compare different Neural Networks. 5. Apply Convolutional Neural Networks.
2	20MCE113	Cyber Forensics Elective-IV	After completion of the course, students will be able to: 1. Understand the need and principles of digital forensics. 2. Summarize various digital investigation process models. 3. Illustration about digital forensic tools. 4. Obtain and analyze digital information for possible use as evidence in digital forensics process. 5. Understand about network basics for digital investigation. 6. Applying forensic science to computers and networks.
	20MCE114	Computer Vision Elective-IV	After completion of the course the students will be able to: 1. Implement fundamental image processing techniques required for computer vision. 2. Apply Fourier transforms, Geometric Transformations. 3. Apply the feature extraction techniques for image description and recognition. 4. Identify computer vision techniques in various real-time interdisciplinary projects. 5. Understand various Image based rendering Techniques.
	20MCE115	Internet of Things Elective-IV	After completion of the course the students will be able to: 1. Gain vision of IoT from a global context. 2. Determine the Market perspective of IoT and Domain Specific Applications 3. Understand the Architectural Overview of IoT 4. Determine the usage of Devices, Gateways and Data Management in IoT. 5. Examining state of the art architecture in IoT and Design Constraints



	20MCE116	Natural Language Processing Elective-IV	After completion of the course the students will be able to: 1. Recognize the importance of Natural Language Processing in the current competitive world. 2. Examine distinct architectures of NLP systems. 3. Identify the basics of Parsing using Word level analysis. 4. Differentiate between syntactic and semantic analysis. 5. Outline the Machine Translation using different approaches. 6. Summarize basic operations in Natural Language Processing using Python.
3	20MCC121	Major Project Work	After completion of the course the students would be able to: 1. Understand to capture project requirements from the client. 2. Analyze and implement software life cycle for the given requirements. 3. Design a real time solution for the given software requirement specifications. 4. Develop the solution for the chosen problem using the concepts and techniques in the curriculum. 5. Writes test cases and applies test case scenarios. 6. Record the entire development process of a particular problem.