CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY(A), HYDERABAD – 75

DEPARTMENT OF MCA

R16

MCA Department Vision

- To become a center of excellence in the field of Computer Applications that produces innovative, skillful and socially responsible professionals who can contribute significantly to industry and research.

MCA Department Mission

- To create the skilled persons in building Software Products.
- To provide opportunities to take up Research Programmes.
- To provide opportunities to participate in design and development process in industries and society.

MCA Program Educational Objectives (PEOs)

PEO1 :Design and build the software products for different needs by the industry and society.
PEO 2: Work with ethics and moral values in industry with constant growth in their future.
PEO 3: Become great innovators and participate in research work to create new applications.

MCA Program Outcomes

PO 1	Ability to understand the mathematical foundations, concepts of Computer Applications to the appropriate problems needed by the industry and society.
PO 2	Able to analyze, design and investigate the real world complex problems to formulate solutions.
PO 3	Able to learn new tools and technologies to find the solutions for the real world problems.
PO 4	Able to develop new applications as an individual or with a team in the context of society and environment.
PO 5	Able to communicate effectively and develop self-confidence
PO 6	Able to possess project management skills and predict the financial assessment with professional ethics.

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SNO	Code	Course	Courses Outcomes (COs)
1	16MCC101	Discrete Mathematics	1. Apply knowledge of the concepts needed to test the logic of a program. 2. Apply knowledge of Boolean algebra and Set Theory. 3. Apply knowledge of Properties of Integers, Relations and Functions. 4. Expose principles of Inclusion and Exclusion, Generating Functions, Recurrence Relations, Groups and Algebraic Structures. 5. Synthesize the indirection of hypothesis and simple indirection methods. 6. Prove elementary properties of modular arithmetic and explain their applications in Computer Science.
2	16MCC102	Computer Programming and Problem Solving	1. Design Algorithms and Flowcharts to solve the various problems. 2. Execute the programs. 3. Apply different data types in various programs. 4. Apply the built-in functions, customized functions and preprocessor directives in various programs. 5. Apply the Arrays and Pointers for solving the problems. 6. Apply the Strings and Structures, dynamic memory allocation techniques and files for solving the various problems.
3	16MCC103	Elements Of Information Technology	1. Get concepts of Information Technology and its Applications. 2. Identify the physical and logical structure of the computer. 3. Gain the knowledge of Network and Communication Technology. 4. Become familiar with the use of Files and Databases. 5. Gain the knowledge of flow of information in an organization and the various levels of management with in an organization. 6. Handle security issues of computers and communication systems.
4	16MBC128	Managerial Economics and Financial Analysis	1. Apply fundamental knowledge of Managerial economics' concepts and tools. 2. Understand various aspects of demand analysis and forecasting. 3. Analyze production function in terms of best combination of inputs. 4. Decide the best cost and benefits to achieve the objectives. 5. Analyze different opportunities and come out with best feasible capital investment decisions. 6. Understand accountancy concepts and conventions, final accounts and financial analysis.

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5	16EGC101	Professional Communication in English	1. Apply critical and creative thinking abilities necessary for effective communication in today's business world. 2. Demonstrate competency in writing effective paragraphs, letters and reports. 3. Become effective, confident speakers and deliver persuasive presentations. 4. Understand the nuances of listening comprehend texts and draw inferences and conclusions. 5. Understand the significance of soft skills in the working environment.
6	16MCC104	Computer Programming Lab Using C	1. Write, compile, debug and execute the programs. 2. Apply various data types in various programs. 3. Apply the built-in functions and customized functions for solving the programs. 4. Use the decision structures, loop structures, functions, and arrays in various programs. 5. Apply pointers, strings and structures in various programs. 6. Write programs using files.
7	16MCC105	Elements of Information Technology Lab	1. Assemble System and Load Software in the system 2. Create professional MS-Word documents 3. Efficiently generate Excel documents. 4. Give efficient presentations. 5. Handle various database applications. 6. Use basic dollar prompt commands in Linux.
8	16EGC102	Professional Communication Lab	1. Understand the speech sounds in English and the nuances of pronunciation. 2. Understand tone, intonation and rhythm and apply stress correctly. 3. Participate in group discussions with clarity and confidence. 4. Speak confidently on stage with appropriate body language. 5. Plan, prepare and face interviews with confidence.
9	16MCC106	Object Oriented Programming(OOP)	1. Gain the knowledge on object oriented programming concepts. 2. Create classes and objects. 3. Acquire knowledge on multithreading and exception handling. 4. Understand the role of Strings and I/O Streams. 5. Design and Develop the GUI Components. 6. Perform event driven programming.
10	16MCC107	Computer Organization	1. Acquainted with the representations of number systems. 2. Understand the concepts of Boolean algebra and K Maps. 3. Learn the basic computer organization and its design. 4. Understand the components of CPU and their functionality. 5. Learn the input–output and memory organization.

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			6. Understands parallel processing and its applicability.
11	16MCC108	Software Engineering	1. Understand the basics of software engineering principles 2. Acquire the knowledge on software development models. 3. Translate the problems into software design models. 4. Acquaint with the basics of software design principles. 5. Understand the basics software testing approaches and strategies. 6. Learn the concepts of software reengineering, reverse engineering and software maintenance activities
12	16MCC109	Data Structures Using C++	1. Gain knowledge on basic concepts of C++. 2. Get the knowledge on classes and inheritance concepts. 3. Learn various linear data structures concepts. 4. Distinguish between different sorting techniques. 5. Implements different collision resolution techniques on hashing. 6. Acquire knowledge on various non-linear data structures.
13	16MCC110	Operations Research	1. Apply the methods to utilize organizational resources effectively. Formulate mathematical models for real world problems. 3. Apply the methods of maximization and minimization to get more profits and reduced losses. 4. Solve linear programming problems. 5. Model and solve the managerial problems using dynamic programming. 6. Apply networks and queuing models to solve organizational problems.
14	16MTC102	Probability and Statistics	1. Describe discrete data graphically and compute measures of centrality and dispersion. 2. Compute probabilities by modeling sample spaces and applying rules of permutations and combinations, additive and multiplicative laws and conditional probability 3. Construct the probability distribution of a random variable, based on a real-world situation, and use it to compute expectation and variance. 4. Compute probabilities based on practical situations using the binomial and normal distributions. 5. Use of statistical inference in practical data analysis.
15	16MCC111	Object Oriented Programming Lab Using Java	1. Write programs using object oriented programming. 2. Develop classes, objects and constructors. 3. Implement multithreading and exception handling concepts.

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			4. Create programs on strings and I/O streams. 5. Develop Applets and AWT Components 6. Apply event handling and arrange layout managers.
16	16MCC112	Data Structures Lab Using C++	1. Design classes, constructors and destructors. 2. Implement programs on various inheritance types. 3. Develop programs on various linear data structures. 4. Implement the programs on different sorting techniques. 5. Implements different collision resolution techniques on hashing. 6. Develop programs on various non-linear data structures.
17	16MCC113	Database Management Systems	1. Acquire the knowledge of the basic concepts of the database. 2. Create the data models. 3. Map 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. 6. Understand the issues in system crash and recovery measures.
18	16MCC114	Web Technologies	1. Develop the web pages using XHTML and CSS. 2. Perform client side validations. 3. Create interactive web pages. 4. Store and transport data using XML. 5. Access MYSQL database using PHP. 6. Design and Develop simple websites.
19	16MCC115	Design and Analysis of Algorithms	1. Analyze the time and space complexities o algorithms. 2. Solve various problems using divide and conquer and greedy method. 3. Solve various problems using dynamic programming, backtracking and branch and bound techniques. 4. Identify the complexity classes such as P, NP, NP-Complete and NP-Hard to which an algorithm belongs and design a feasible solution. 5. Determine the amortized running time of the problem.
20	16MCC116	Operating Systems	1. Get the knowledge of operating system components and its services. 2. Understand the basic process execution in terms of threads and they came to know about different thread libraries. 3. Learn the various process synchronization tools and they came to know about dead lock and its issues. 4. Distinguish the mapping between the physical memory and virtual memory. 5. Apply file handling concepts in OS perspective. 6. Acquire the knowledge of components and

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			services of LINUX Operating System.
21	16MCC117	Database Management Systems Lab	1. Populate and query a database using SQL DML/DDL commands. 2. Declare and enforce integrity constraints on a database using a state-of-the-art RDBMS 3. Implement the views with multiple options. 4. Programming PL/SQL including stored procedures, stored functions, cursors, packages. 5. Access and control authorization. 6. Design and build a Forms and Reports
22	16MCC118	Web Technologies Lab	1. Create static web pages using XHTML and CSS. 2. Create dynamic web pages and perform client side validations using JavaScript. 3. Store and Transport data using XML. 4. Write programs using PHP. 5. Access MYSQL database through PHP. 6. Design and Develop websites.
23	16MCC119	Operating Systems Lab	1. Write programs on system calls, threads and signals. 2. Write programs on process scheduling algorithms 3. Write programs on Inter process Communication. 4. Write programs on synchronization problems 5. Write programs on files 6. Use basic Linux commands 7. Write basic shell programs
24	16MCC120	Computer Networks	1. Gain good knowledge of the basics of data communication and networks. 2. Get an overview of the different layers of OSI model. 3. Gain knowledge of Flow and Error control mechanisms of Data Link layer. 4. Design various Routing Algorithms of Network layer. 5. Formulate Transport layer protocols and concepts of Application layer. 6. Acquire the knowledge of Socket programming.
25	16MCC121	Data warehousing and Data Mining	1. Identify the scope of Data Mining & Warehousing for the society. 2. Design of Data Warehouses and integrate the Data Mining system for various organizations. 3. Apply Data Mining functionalities to solve the real world problems 4. Design and implement the various data mining algorithms based on various requirements 5. Identify interesting patterns and presentation techniques in making decisions 6. Make base for further research on advanced Data Mining Techniques
26	16MCC122	Advanced Java Programming	1. Get the knowledge of servlets, session management and usage of JDBC in servlets. 2. Employ the java beans, Application builder tool and java beans API. 3. Demonstrate the EJB Architecture, EJB

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			requirements and EJB entity beans. 4. Demonstrate the EJB clients, deployment tips and perl control structures and operators. 5. Identify the JSP scripting elements & directives and java messaging services. 6. Examine the JDBC driver connection to database, Row set object and Result set
27	16MCC123	Computer Networks Lab	1. Use Networking commands. 2. Implement connection oriented and connection less iterative programs. 3. Execute connection oriented and connection less concurrent programs. 4. Implement the Pre fork Server program. 5. Run the program on Remote command execution. 6. Execute programs on Advanced Socket System Calls.
28	16MCC124	Data warehousing and Data Mining Lab	1. Understand the need of Data Warehouses over Databases. 2. Load the data from different sources and preprocess of different types of the data. 3. Build variety of data models useful in modeling data. 4. Use data mining functionalities in different Scenarios. 5. Prepare graphs using data mining tools for patterns presentation. 6. Execute variety of algorithms.
29	16MCC126	Object Oriented System Development(OOSD)	1. Understand the basic building blocks of UML. 2. Use the knowledge and applications of nine UML diagrams. 3. Acquire the knowledge of how to model the object oriented applications through UML. 4. Acquire the knowledge of Structural and Behavioral modeling 5. Apply the knowledge of dynamic and architectural modeling. 6. Study the concepts of RUP, USDP and models.
30	16MCC127	Machine Learning	1. Acquire the basic knowledge of Machine Learning; identify algorithms, machine learning problems. 2. Ability to classify data sets using classifiers. 3. To be familiar with prediction Techniques. 4. Able to recognize patterns using Machine Learning models. 5. Ability to apply dimensionality reduction techniques on different datasets. 6. Create ensemble methods.
31	16MCC128	Cryptography & Network Security	1. Compare various cryptographic techniques. 2. Design secure applications. 3. Inject secure coding in developed applications. 4. Develop secure cipher models. 5. Generate secure e-mail, IP and Web security algorithms. 6. Build secure system

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32	16MCC129	Object Oriented System Development Lab	1. Understand the browsing and viewing sections of Rational Rose case tool. 2. Gained the knowledge of selecting a case study and converting it to be suitable to model in UML. 3. Gained the knowledge to draw and model the UML diagrams. **4.** Gained the practical knowledge of structural modeling of Object Oriented Applications through UML. **5.** Gained the practical knowledge of dynamic modeling of Object Oriented Applications through UML. 6. Gained the knowledge of technical writing and documentation of the case study in IEEE format
33	16MCC130	Machine Learning Lab using Python	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
34	16MB C04	Organizational Behavior	1. Analyze the behavior, perception and personality of individuals and groups in organizations in terms of the key factors that influence organizational behavior. 2. Assess the potential effects of organizational-level factors on organizational behavior. 3. Critically evaluate the potential effects of motivating and leading the individuals in the Organization. 4. Analyze organizational behavioral issues in the context of groups, power, politics and conflict issues.
35	16CE C03	Human Values and Professional Ethics	1 Develop the capability of shaping themselves into outstanding personalities, through a value based life. 2 Turn themselves into champions of their lives. 3 Take things positively, convert everything into happiness and contribute for the happiness of others. 4 Become potential sources for contributing to the development of the society around them and institutions / organizations they work in. 5 Shape themselves into valuable professionals, follow professional ethics and are able to solve their ethical dilemmas.
36	16ME E20	Entrepreneurship	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

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			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
37	16CE E21	Disaster Mitigation and Management	1. Analyze and critically examine existing programs in disaster management regarding vulnerability, risk and capacity at local level 2. Choose the appropriate activities and tools and set up priorities to build a coherent and adapt a disaster management plan. 3. Understand various mechanisms and consequences of natural and human induced disasters for the participatory role of engineers in disaster management. 4. Develop an awareness of the chronological phases of disaster preparedness, response and relief operations for formulating effective disaster management plans 5. Understand various participatory approaches/strategies and their application in disaster management 6. Understand the concepts of remote sensing and geographical information systems for their effective application in disaster management.
38	16MCE101	Microprocessor	1. Gain the knowledge of basic principles of Microprocessors. 2. Understand the architecture of 8085. 3. Verse with the knowledge of Instruction sets of 8085. 4. Understand the knowledge of programming concepts of 8085. 5. Facilitate themselves with the knowledge of Interrupt cycles of 8085. 6. Gain the knowledge of the functionality and interfacing of various peripheral devices.
39	16MCE102	Software Testing	1. Gain the basic knowledge of Testing. 2. Acquire the knowledge of White Box Testing methods. 3. Test an application using Functional Testing. 4. Gain knowledge about Integration and System Testing. 5. Use Object Oriented Testing and Millennium Testing methods. 6. Explore on testing types which are to be applied for various applications.
40	16MCE103	Artificial Neural Networks	1. Gain the knowledge of ANN techniques and their applications. 2. Understand the various algorithms for ANN. 3. Apply various algorithms for ANN. 4. Understand the clustering concepts and algorithms 5. Bring out structural ART networks and feature extraction techniques. Identify, Analyze, Formulate and solve different application oriented problems
41	16MCE104	Principles of Multimedia	1. Understand the knowledge of Multimedia

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			concepts. 2. Learn the elements and techniques of Multimedia to the students. 3. Understand with the global applications of Multimedia in various domains. 4. Learn the various compression techniques. 5. Understand the various streaming techniques. 6. Learn the Multimedia principles in client oriented projects.
42	16MCE105	Advanced Operating Systems	1. Gain knowledge about advanced concepts in OS 2. Develop OS for distributed systems 3. Implement protection and security for distributed systems 4. Develop Fault tolerant systems 5. Understand multiprocessor operating systems 6. Analyze and design modules for Real time operating systems
43	16MCE106	Cloud Computing	1. Identify the components of cloud computing for service perspective. 2. Apply the Cloud Computing developing tools. 3. Imply the Cloud Computing models for developing best applications. 4. Give services in Real time requirements. 5. Apply large data processing methods in Clouds. 6. Use the maximum Cloud Computing resources properly.
44	16MCE107	Software Project Management	1. Gain basic knowledge of software project management principles 2. Come up with a project schedule and assign resources 3. Choose an appropriate project development model. 4. Identify project risks, monitor and track project deadlines. 5. Work in a team environment and be aware of different modes of communications. 6. Understand the various levels of quality metrics and measurements.
45	16MCE108	Pattern Recognition	1. Facilitate the Pattern Recognition Techniques and their applications. 2. Understand various algorithms for pattern recognition 3. Apply algorithms for pattern recognition. 4. Understand the clustering concepts and algorithms 5. Bring out structural pattern recognition and feature extraction techniques. 6. Identify, Analyze and formulate various application domains.
46	16MC E109	Distributed Systems	1. Apply the basic principles of distributed system layouts and purpose. 2. Study the utility and applications of middle ware in distributed system. 3. Use the topology of DNS, utility of

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			synchronization principles of global clocks. 4. Gained the knowledge of fault tolerance principles, security issues. 5. Apply the knowledge of standard middleware architectures like CORBA, D-COM etc. 6. Acquire the principles and issues with regards to distributed shared memory concepts
47	16MC E110	Internet of Things	1. Gain vision of IoT from a global context. 2. Determine the Market perspective of IoT. 3. Use Devices, Gateways and Data Management in IoT 4. Implement IoT standards and Business processes 5. Build state of the art architecture in IoT. 6. Develop Applications of IoT in Industrial and Commercial Building Automation and Real World Design Constraints.
48	16MC E111	Business Intelligence and Analytics	1. Get clear idea about the basic concepts of business analytics in an organization. 2. Demonstrate detailed knowledge about the role of business analytics in decision making. 3. Distinguish between descriptive, predictive and prescriptive analytics. 4. Gaining knowledge on data warehousing and data mining concepts. 5. Understand the usefulness of business analytics in various functional areas of an organization. 6. Understand the future directions for business analytics.
49	16MC E112	Middleware Technologies	1. Various Middleware Technologies are learned. 2. Acquire the knowledge of EJB and its types. 3. Learns Service Oriented Architecture. 4. Learns Extensible Markup Language
50	16MC E113	Big Data Analytics	1. Develop framework for handling Big Data using Hadoop 2. Acquire, Store and analyse big data in business environments using HDFS 3. Develop programs in MapReduce to solve real world problems 4. Model data using MongoDB 5. Handle semi structured and unstructured big data using Pig 6. Process and query big data in HDFS environment using Hive
51	16MC E114	E-Commerce	1. Apply knowledge of Basics on E Commerce and its Applications. 2. Obtain knowledge on E Commerce Network Infrastructure 3. Get Knowledge on E Commerce Security Issues and its solutions. 4. Apply exposure on various electronic Payment systems 5. Obtain knowledge on various Electronic Advertisements. 6. Gets Exposure on the basics of M Commerce.

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52	16MC E115	Mobile Computing	1. Gain Good Knowledge on Data Communications. 2. Have knowledge of telecommunications and broadcasting systems. 3. Aware of Wireless Transmissions and Protocols. 4. Acquire the knowledge of Mobile Technologies. 5. Implement Various wireless standards 6. Develop mobile applications.
53	16MC E116	Cyber Forensics	1. Get the Cyberspace concepts. 2. Use fundamentals of forensics. 3. Apply evidence capturing process. 4. Preserve the digital evidence.
54	16MCC125	Mini Projects	1. Implement the basic level technologies pertaining to Front End, Middleware and Back End. 2. Implement the Major Project successfully.
55	16MCC131	Seminars	1. Conduct a independent technical study and survey on the selected topic. 2. Prepare a PPT slides presentation. 3. Deliver a speech and presentation of the study topic in front of the class and evaluating faculties.
56	16MCC132	Major Project Work	1. Understand to capture project requirements from the client/end users. 2. Understand and implement software life cycle for the given requirements. 3. Design a real time solution for the given software requirement specifications 4. Understand how to develop test cases and design test case scenarios. 5. Document the entire project work in IEEE standards and format.

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MCA Department Vision

To become a center of excellence in the field of Computer Applications that produces innovative, skillful and socially responsible professionals who can contribute significantly to industry and research.

MCA Department Mission

To churn out skilled individuals who are ready to innovate in the world of computer applications.

MCA Program Educational Objectives

1. Design and build the software products for different needs by the industry and society.
2. Work with ethics and moral values in industry with constant growth in their future.
3. Become great innovators and participate in research work to create new applications.

MCA Program Outcomes

1. Ability to understand the mathematical foundations, concepts of Computer Applications to the appropriate problems needed by the industry and society.
2. Able to analyze, design and investigate the real world complex problems to formulate solutions.
3. Able to learn new tools and technologies to find the solutions for the real world problems.
4. Able to develop new applications as an individual or with a team in the context of society and environment.
5. Able to communicate effectively and develop self-confidence
6. Able to possess project management skills and predict the financial assessment with professional ethics.

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(AUTONOMOUS)
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.
3	20MCC10	Software Engineering	After completion of the course, the students will be able to:

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	3		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

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			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 nuances of pronunciation in English 2. Apply stress correctly and speak with the proper tone, intonation and rhythm. 3. Differentiate various soft skills

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			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 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.

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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. 6. Understand the issues in system crash and recovery measures.

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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.
	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.

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			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. -

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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.

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

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			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	20MCC1 15	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	20MCC1 16	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. 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.

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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	20MCEI05	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 role and functionalities of IaaS, PaaS, SaaS service infrastructure mechanisms 6. Apply large data processing methods in Clouds.
	20MCEI06	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

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			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. 6. Apply and Build Struts based application using MVC Architecture.
6	20MCA 101	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,

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			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 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

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			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

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	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.

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