



FATIMA COLLEGE

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Affiliated to Madurai Kamaraj University
Re-Accredited with 'A++' (CGPA 3.61) by NAAC (Cycle - IV)
Mary Land, Madurai - 625018, Tamil Nadu

FATIMA COLLEGE (AUTONOMOUS), MADURAI – 625018

2021 - 2022

1.1.1 Curricula developed and implemented have relevance to the local, national, regional and global developmental needs which is reflected in Programme outcomes (POs), Programme specific outcomes (PSOs) and Course Outcomes (COs), of the Programmes offered by the Institution.

NAME OF THE PROGRAMME: MCA

Programme Outcomes (POs)

PO 1	Apply the knowledge of computing maths and science for the solution of problems and requirements
PO 2	Identify, critically analyze, formulate and develop computer applications using fundamental principles of relevant domain disciplines
PO 3	Design and evaluate solutions for computer based problems to meet the desired needs within realistic constraints such as safety, security and applicability
PO 4	Use research based knowledge to conduct experiments and interpret data to attain well-defined conclusions.



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PO 5	Create, select and apply modern computing tools by understanding the limitations, with dexterity.
PO6	Demonstrate the competency in programming skills as per industry expectations.
PO7	Understand the impact of system solutions in societal, environmental and cultural issues within local and global contexts for sustainable development
PO8	Commit to professional ethics and cyber regulations, responsibilities & norms.
PO9	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary environment to manage projects.
PO10	Communicate effectively with the society about computing technologies.
PO11	Demonstrate knowledge and understanding of the management principles and apply these to manage projects.
PO12	Appreciate the importance of goal setting and to recognize the need for life-long learning in the broadest



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context of technological change.

Programme Outcomes (POs)

PSO 1	Ability to design and develop applications in the computing discipline to meet the customer's business objectives.
PSO 2	Ability to Integrate various system components to provide user interactive solutions for various challenges
PSO 3	Ability to test and maintain the software applications with latest computing tools and technologies.
PSO 4	Ability to understand the evolutionary changes in the practices and strategies in software project development.
PSO 5	Ability to enhance teamwork and leadership skills to solve time critical problems



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Course Outcomes (COs)

Course Code	Course Title	Nature of the Course (Local/National/ Regional /Global)	Course Description	Course Outcomes
20MCA101	Mathematical Foundation of Computer Science	National	This course provides the logical, analytical and mathematical concepts that are fundamental for Computer Science.	CO 1: Perform Logical operations and predicate calculus needed for computing skill. CO2: Analyze and Compare the various techniques for solving numerical equations. CO3: Apply the techniques of statistics and numerical methods to unravel problems by



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				computers. CO4: Explain the set theory logic. CO 5: Utilize the Knowledge of matrices for designing and solving problems
20MCA102	Software Engineering	Global	This course provides the fundamental perception of Software Engineering which includes system requirements, finding the effective methods to analyze, design, code, test and implement the full	CO 1: Compare the different domains and process models. CO 2: Identify the data, class and flow oriented modeling concepts. CO 3: Analyze on the design oriented concepts. CO 4: Identify the



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			application with appropriate tools	managerial aspects of software development. CO 5: Generate project schedule for different activities of software development
20MCA103	Operating Systems	Global	This course provides knowledge on the concepts of abstraction, scheduling mechanisms, implementations and manages a computer's resources,	CO 1: Identify the components and processes. CO 2: Analyze on scheduling algorithms and deadlocks. CO 3: Demonstrate the mapping between the physical memory and



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			especially the allocation of those resources among other programmes	virtual memory. CO 4: Identify the secondary memory management techniques. CO 5: Analyze on the distributed systems and security issues.
20MCA104	Programming In Python	Global	This course provides the basics of writing and running Python scripts to more advanced features such as file operations, regular expressions, working with OOPs concept	CO 1: Predict the basics of Python programming. CO 2: Solve problems requiring the writing of well-documented programs in the Python language, including use of the logical constructs of that



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			and using the extensive functionality of Python modules. Extra emphasis is placed on features unique to Python, such as tuples, array slices, and output formatting	language. CO 3: Use and manipulate Lists and python exception handling model to develop robust programs. CO 4: Formulate solutions for String, tuples and File operations. CO 5: Apply object-oriented programming concepts to develop dynamic interactive Python applications
20MCA105	Lab I – Python Programming	Global	This course provides the practical knowledge of	CO 1: Implement Math functions, Strings, List and Tuple in Python programs.



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			implementing Python programs with loops, functions and represent compound data using lists, tuples and dictionaries.	CO 2: Express different Decision Making statements and Functions. CO 3: Interpret Object oriented programming in Python & File handling operations
20MCA106	Lab Ii – Rdbms	Global	This course provides practical knowledge in PL/SQL programming, utilizing the services provided by Oracle database in a stored procedure perspective. This also includes implementation of	CO 1: Enhance Programming skills and techniques. CO 2: Formulate complex queries using SQL CO 3: Use the PL/SQL code constructs of IF-THEN-ELSE and LOOP types as well as syntax and command functions.



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			Subprograms, Triggers, and Cursors concepts in depth	
29MCA107	Skill Based Lab I – Linux	Global	This course provides focus on the fundamental tools and concepts of Linux and Unix OS. It gives practical exposure on topics such as LINUX environment, commands, file system, processes and utilities. Specific emphasis is given to the bash shell and user environment	CO 1: Use Linux utilities and develop shell scripts to perform tasks. CO 2: Effectively use Linux environment to accomplish software development tasks. CO 3: Monitor system performance and network activities.



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			with several flavours of UNIX/Linux using a version of Red Hat Linux.	
20MCA108	Soft Skills I – Professional Communication	National	This course provides skills of oral and written communication to work in different environments, develop emotional sensitivity and an awareness of how to work and negotiate with people.	CO 1: Display competence in oral and written communication. CO 2: Use current technology related to the communication.
20MCA201	Data Structures	Global	This course provides	CO 1: Select



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	And Algorithms		knowledge on several fundamental algorithms and data structures and to implement them in C++ to be an effective designer, developer, or customer for new applications.	<p>appropriate data structures as applied to specified problem definition.</p> <p>CO 2: Implement operations like searching, insertion, deletion and traversing in trees.</p> <p>CO 3: Compare the data structures of advanced search trees.</p> <p>CO 4: Implement appropriate heap operations, sorting, searching techniques for a given problem.</p> <p>CO 5: Determine and analyze</p>
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				the complexity of graph Algorithms.
20MCA202	Web Technologies	Global	This course provides the student with foundational programming knowledge and skills for application development on the Internet.	<p>CO 1: Use knowledge of HTML and CSS to create personal and/or business websites</p> <p>CO 2: Create effective scripts using JavaScript and jQuery to enhance the end user experience.</p> <p>CO 3: Write PHP scripts to handle HTML forms.</p> <p>CO 4: Test, debug, and deploy web pages containing PHP and MySQL</p>



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				L. CO 5:Implement SQL language, JavaScript, Ajax, JQuery, PHP and CSS in the project.
20MCA203	Programming In Java	Global	This course provides an exhaustive coverage of Core Java programming language features like OOPS and GUI programming.	CO 1: Apply the basic Java constructs to develop solutions to real time problems. CO 2: Analyze the hierarchy of java classes to develop object oriented programs. CO 3: Design software in Java using Packages and



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				<p>Threads.</p> <p>CO 4: Implement Concepts of AWT for creating GUI.</p> <p>CO 5: Design a Software using JDBC.</p>
20MCA204	Lab Iii – Web Technologies	Global	<p>This course provides information about two powerful technologies. Together, these two technologies provide a powerful platform for building database-driven Web applications.</p>	<p>CO 1: Design WebPages using server side scripting.</p> <p>CO 2: Use PHP built-in functions and custom functions for processing.</p> <p>CO 3: Create various interactive and dynamic websites</p>



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20MCA205	Lab Iv – Java Programming	Global	This course provides experiential learning in the implementation of Core Java Programming.	<p>CO 1: Apply the basic Java constructs to develop solutions to real time problems.</p> <p>CO 2: Analyze the hierarchy of java classes to develop object oriented programs.</p> <p>CO 3: Design software in Java using Packages and Threads.</p> <p>CO 4: Implement Concepts of AWT for creating GUI.</p> <p>CO 5: Design a</p>



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				Software using JDBC.
20MCA206	SKILL BASED LAB II – R PROGRAMMING	Global	This course provides an in-depth knowledge on the basic constructs and statistical analysis in R.	CO 1: Demonstrate the practical application of R programming tool. CO 2: Emphasize the implementation of statistical operations in R
20MCA207	SOFT SKILLS II – APTITUDE TRAINING	National	This course provides gamut of skills which facilitate the students to enhance their employability quotient and to establish a stronger	CO 1: Apply quantitative techniques to solve variety of problems. CO 2: Enhance the technical skills for employability.



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			connect with the technical environment in which they operate. It makes them think critically and apply basic mathematics skills to interpret data, draw conclusions and solve problems.	
20MCA301	Internship & Mini Project	Global		
20MCA302	Software Quality & Testing	Global	This course provides a basic knowlwdge of in	CO 1: Identify the Fundamentals of concepts of Software testing and



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			software testing and quality management with the help of different software testing tools.	Software Quality Management CO 2: Implement process that ensures the Software is developed with quality standards. CO 3: Use the latest tools that help in Software testing and quality assurance. CO 4: Develop quality management methods to effectively organize staff. CO 5: Deploy a successful development of the Software product.
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20MCA303	Mobile Application Development	Global	<p>This course introduces students to programming technologies, design and development related to mobile applications. Students will learn application development on the Android platform.</p>	<p>CO 1: Understand the capabilities and limitations of mobile platforms that affect application development and deployment.</p> <p>CO 2: Compare and analyze various technology and business trends impacting mobile application development.</p> <p>CO 3: Demonstrate the characterisation and architecture of mobile applications</p> <p>CO 4: Assess the way how to send messages</p>
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				through android phones. CO 5: Design and develop the techniques for deploying and testing mobile applications, and for enhancing their performance and scalability.
20MCA304	Enterprise Application Development	Global	This course provides exposure to different frameworks namely, Struts, Hibernate, Spring and Django. This collective information supports the learner for	CO 1: Develop dynamic web applications using MVC. CO 2: Use dependency injection & inversion of control in developing Spring project. CO 3: Create the Struts



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			developing advanced enterprise applications	classes and use MVC design pattern for creating large web applications CO 4: Map Java classes and object associations to relational database tables with Hibernate mapping files Map Java classes and object associations to relational database tables with Hibernate mapping files CO 5: Use Django for rapid development, pragmatic, maintainable, clean design, and secures websites
20MCA305	Lab V - Mobile Application	Global	This course provides	CO 1: Install and



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	Development		knowledge of developing applications for mobiles using native and hybrid frameworks	configure Android application development tools. CO 2: Design and develop user Interfaces for the Android platform. CO 3: Apply Java programming concepts to Android application development CO 4: Familiar with technology and business trends impacting mobile applications CO 5: Include database and maps in apps to facilitate societal centric
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				applications.
20MCA306	Lab Vi –Enterprise Application Development	Global	This lab course provides the experience in creating, debugging, testing & deploying dynamic web applications. It also gives thorough coverage of the use of MVC for creating web applications	CO 1: Perform Database operations for web applications using MVC. CO 2: Develop database application using Spring JDBC/Struts with CURD functionality. CO 3: Enable multilingual websites by using its built-in internationalization system
20MCA307	Skill Based Lab Iii – Computer Aided Software Engineering (Case)	Global	This course provides automation of the entire information systems development	CO 1: Planning project using open source planning tools. CO 2: Designing



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	Tools		life cycle process using a set of integrated software tools	project using designing tools CO 3: Testing projects using testing tools
20MCA308	Soft Skill Iii – Interpersonal Skills For Corporate Readiness	Global	This course provides the skills needed to find a job and also the skills needed to excel at the time of entering a career	CO1: Develop skills for producing high quality etiquettes at the time of interviews CO2: To Exhibit competencies expected by employers CO3: Demonstrate emotional intelligence and inter cultural competencies and to be ready to work in teams , unambiguous after



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				reducing it to normal forms
20MCA401	Lab Vii - Uix Design Programming	Global	This course provides an overview of client-side web user interfaces. It focuses on grids and responsive design using CSS pre-processors, Less and Sass and the basics of Node.js. It takes the students to move to the next level by building data-driven web apps using React	<p>C01: Design websites using various React and Angular features</p> <p>C02: Build applications using Node.JS along with MongoDB & MySQL</p> <p>C03: Utilize the conceptual and practical aspects of CSS Pre-processors.</p>
19MCA501	Software Project Management	Global	This course provides knowledge in applying different	CO 1: Deliver successful software projects that support



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			techniques to monitor & control project and people	organization's strategic goals CO 2: Match organizational needs to the most effective software development model CO 3: Plan and manage projects at each stage of the software development life cycle CO 4: Create project plans that address real- world management challenges CO 5: Develop the skills for tracking and controlling software
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				deliverables CO 6: Predict the behavior of people working in teams and to explore the ways of Managing people in Software Environments.
19MCA502	Machine Learning	Global	This course provides an introduction to learn Machine Intelligence and Machine Learning Applications algorithms to solve real world problems.	CO1: Identify the concepts of machine learning. CO2: Demonstrate the supervised and unsupervised learning algorithms for classification, prediction and clustering. CO3: Analyze the logic behind the execution of



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				<p>various classifiers.</p> <p>CO4: Compare the performance of different algorithms available for mining data.</p> <p>CO5: Propose solution for real world problems</p>
19MCA503	Enterprise Application Development	Global	<p>This course provides exposure to different frameworks namely, Struts, Hibernate, Spring and Django. This collective information supports the learner for developing advanced enterprise</p>	<p>CO1: Develop dynamic web applications using MVC</p> <p>CO2: Use dependency injection & inversion of control in developing Spring project</p> <p>CO3: Create the Struts classes and use MVC design pattern for creating</p>



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			applications.	large web applications CO4: Map Java classes and object associations to relational database tables with Hibernate mapping files CO5: Use Django for rapid development, pragmatic, maintainable, clean design, and secures websites.
19MCA504	Lab –Ix- Machine Learning With Python	Global	This course provides experiential learning and implementation of machine learning concepts using python	CO1: Demonstrate the concept of classification & clustering in Python CO2: Analyse and Evaluate the models built. CO3: Create classification and clustering models



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				using sci-kit learn.
19MCA505	Lab X – Enterprise Application Development	Global	This lab course provides the experience in creating, debugging, testing & deploying dynamic web applications. It also gives thorough coverage of the use of MVC for creating web applications.	CO 1: Perform Database operations for web applications using MVC CO 2: Develop database application using Spring JDBC/Struts with CURD functionality. CO 3: Enable multilingual websites by using its built-in internationalization system
19MCA506	R Programming	Global	This course provides an in-depth knowledge on the basic constructs and	CO 1: Demonstrate the practical application of R programming tool. CO 2: Emphasize the



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			statistical analysis in R.	implementation of statistical operations in R
19MCA507	Interpersonal Skills For Corporate Readiness	National	This course provides the skills needed to find a job and also the skills needed to excel at the time of entering a career.	CO 1: Outline the roles played in workgroups and teams CO 2: Describe how good communication influences working relationship.
19MCA602	Internet Of Things	Global	This course provides the knowledge required to design an IOT system to connect embedded	CO 1: Identify the Fundamentals of Internet of Things. CO 2: Design a portable IoT using relevant



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			sensors.	<p>protocols.</p> <p>CO 3: Analyze applications of IoT in real time scenario.</p> <p>CO 4: Develop web services to access/control IoT devices.</p> <p>CO 5: Deploy an IoT application and connect to the cloud</p>
19MCADS01	Big Data Analytics	Global	<p>This course provides familiarization to the important information technologies used in manipulating, storing and analyzing big</p>	<p>CO 1: Work with big data platform and Understand the fundamentals of various big data analysis techniques</p> <p>CO 2: Analyze the big</p>



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			data.	data analytic techniques for useful business applications. CO 3: Design efficient algorithms for mining the data from large volumes. CO 4: Examine the HADOOP and Map Reduce technologies associated with big data analytics CO 5: Explore the applications of Big Data
19MCADS02	Big Data Security	Global	This course provides an overview of the cutting edge and new technologies in the	CO 1: Identify the need for security and best practices in a big data



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			area of big data security.	environment CO 2: Analyze the steps to secure big data CO 3: Build security in hadoop eco system CO 4: Assess the sensitivity of data in Hadoop CO 5: Outline data security and event logging
19MCADS03	Data Analytics Using Pig And Hive	Global	This course provides knowledge on creating applications to analyze big data.	CO 1: Outline the programming constructs of Pig and database management using HiveQL CO 2: Write scripts



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				<p>using Pig latin and perform various HiveQLqueries by applying RDBMS concepts</p> <p>CO 3: Apply the concepts of Pig and Hive in simple tasks</p> <p>CO 4: Formulate and analyse different databases for different situations</p> <p>CO 5: Create real time applications</p>
19MCANW01	Cryptography And Network Security	Global	This course provides basic understanding of previous attacks on cryptosystems with the aim of preventing future attacks and to	<p>CO 1: Evaluate the fundamentals of networks security, security architecture, threats and vulnerabilities.</p> <p>CO 2: Compare Stream</p>



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			provide security using various cryptographic tools	ciphers and block ciphers. CO 3: Apply the different cryptographic operations of public key cryptography. CO 4: Pertain the various Authentication schemes to simulate different applications. CO 5: Analyze various Security practices and System security standards
19MCANW02	Wireless Sensor Networks	Global	This course provides knowledge on the architectures, functions and performances of	CO 1: Formulate the basic standardization of wireless networks. CO 2: Analyze the implementation of



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			wireless sensor technologies related to systems and WSN. platforms. It also describes and analyze the specific requirements for applications in wireless sensor networks regarding energy supply, memory, processing and transmission capacity	CO 3: Identify and understand the security issues in ad hoc and sensor networks. CO 4: Compare the protocols and to promote the research work in this area. CO 5: Apply and solve problems in the applications of Wireless Networking Area.
19MCANW03	High Speed Networks	Global	This course covers the basics,	CO 1: Identify the building blocks and



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			architectures, protocols and technologies for high-speed networks. It includes LANs, Protocols, TCP/IP Suite, Data Networks, high speed LANs, link level flow and error control, transport level traffic control, routing, MPLS switching and Network security.	operation of high speed networking and ATM. CO 2: Analyze the cause of congestion, traffic slow down and related factors for Quality of Service Identify. CO 3: Apply the concepts learnt in this course to optimize performance of high-speed networks using Flow Control. CO 4: Compare the different architectures used for HSN. CO 5: Describe the
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				protocols that are used to design high speed networks.
19MCAAD01	Web Programming Techniques	Global	This course focuses on the two broad divisions of web development, front-end and back-end development. It gives information on how to load a web application, design and how to interact with web pages using HTML, CSS and JavaScript	<p>CO 1: Understand the basics of HTML tags.</p> <p>CO 2: Analyze the advanced features of HTML5.</p> <p>CO 3: Implement the use of internal and external Cascading Style Sheets (CSS) to format elements on single or group of pages.</p> <p>CO 4: Compose programs fo</p>



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				<p>r the web and other contexts using the JavaScript programming language.</p> <p>CO 5: Apply various ECMAScript 6 methods in building interactive websites.</p>
19MCAAD02	Internet Programming Frameworks	Global	<p>This course provides an overview of client-side web UI frameworks of Bootstrap 4. It focuses on grids and responsive design using CSS pre-</p>	<p>CO 1: Analyze React Components, the building blocks and its interaction with other web applications.</p> <p>CO 2: Design websites using various Angular features including</p>



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			processors, Less and Sass and the basics of Node.js. It takes the students to move to the next level by building data-driven web apps using React	directives, components and services. CO 3: Compute and build applications using Node.JS along with the combination of Bootstrap. CO 4: Apply the concepts of MongoDB & MySQL, the back-end databases. CO 5: Utilize the conceptual and practical aspects of CSS Pre-processors and JSON
19MCAAD03	Software Development Frameworks	Global	This course provides an immersive experience in the	CO1: Explain the fundamental principles and practices of the agile



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			technical, cultural and social aspects of Agile and Devops.	development methods. CO2: Analyze the planning and execution of the agile manifesto CO3: Monitor the management to achieve complete product development. CO4: Practice the integration of development and operations in software projects. CO5: Present the software project by following the principles that best fit the technical and market demands
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19MCAGE01	Resource Management Techniques	Global	This course provides solution to problems in different environment that needs decision making using optimization techniques.	<p>CO 1: Identify the applications of Operations Research and methods to solve business problems.</p> <p>CO 2: Apply linear programming to solve operational problem with constraints.</p> <p>CO 3: Apply transportation and assignment models to find optimal solution in warehousing and Travelling,</p> <p>CO 4: Prepare project scheduling using PERT and CPM.</p> <p>CO 5: Use</p>
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				optimization concepts in real world problems
19MCAGE02	Financial Management And Accounting	Global	This course provides an overview of financial concepts, process and operations from a managerial perspective.	<p>CO 1: Preparation and analysis of balance sheet.</p> <p>CO 2: Predict the Classification of Costing.</p> <p>CO 3: Decide the budget preparation and control of a company.</p> <p>CO 4: Analyze the flow of funds.</p> <p>CO 5: Use Tally to implement the needs of financial accounting</p>
19MCAGE03	Management	National	This course provides	CO 1: Analyze and



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	Information Systems		the concept and the role of management information systems to achieve strategic goals and to gain competitive advantages	<p>synthesize business information needs to facilitate evaluation of strategic alternatives.</p> <p>CO 2: Apply MIS knowledge and skills learned to facilitate development, deployment and management of information systems.</p> <p>CO 3: Predict the use of information technology for business processes.</p> <p>CO 4: Assess the use of technology of Information Systems for effective management.</p>
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				CO 5: Identify the security features and global issues in organization and society
19MCAGE04	E-Commerce	Global	This course provides information on the combination of Internet with E-Commerce, options available for doing business on the Internet, features that helps to build E-Commerce web sites, marketing issues, payment options, security issues and	<p>CO 1: Gain a comprehensive understanding of the E-Commerce landscape, current and emerging technology and infrastructure underpinnings of the business.</p> <p>CO 2: Analyze the impact of E-commerce on business models and</p>



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			customer service.	<p>strategy.</p> <p>CO 3: Develop an understanding on how internet can help business grow/ Describe the infrastructure for E-commerce</p> <p>CO 4: Assess electronic payment systems</p> <p>CO 5: Gain an understanding on the importance of security, privacy, and ethical issues as they relate to E-Commerce.</p>
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19MCAGE05	Cyber Forensics	Global	<p>This course provides the investigation of computer-related crimes with the goal of obtaining evidence to be presented in a court of law</p>	<p>CO 1: Predict the forensics fundamentals and the various technologies used to avoid computer crimes.</p> <p>CO 2: Illustrate different methods to collect and preserve digital evidence and Digital Crime Scene.</p> <p>CO 3: Identify and Analyze Forensic Technical Surveillance Devices.</p> <p>CO 4: Evaluate the Various tools and tactics followed in military.</p> <p>CO 5: Demonstrate the</p>
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				Usage of surveillance tools for tracking cyber criminals
19MCAGE06	Ethics Computing	In Global	This course provides the basis for ethical decision-making and the methodology for reaching ethical decisions concerning computing matters	CO 1: Predict the relationship between the law, ethics and computer technology. CO 2: Outline the philosophical and ethical debates with the ideas and the nature of intellectual creativity. CO 3: Design the impact of computer technology on free speech. CO 4: Formulate the ethical and legal issues of the impact that computing



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				technologies had on workplace. CO 5: Develop a personal standpoint in relation to DataBase society and the usage of biometric data.
19MCAGE07	Entrepreneurship Development	Global	This course provides the skills necessary to succeed as an entrepreneur. It includes the fundamentals of starting and operating a business, developing a business	CO1: Highlight the salient characteristics of successful entrepreneur CO2: Enumerate the competencies relevant for Entrepreneurial development. CO3: Delineate the growth of women



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			plan, obtaining financing, marketing a product or service and developing an effective accounting system	Entrepreneurship in India. CO4: Identify the major problems faced in conducting EDPs. CO5: Discuss the methods of project appraisal used for small scale enterprises
19MCAGE21	Research Methodology	Global	This course provides an overview of various methods employed in quantitative and qualitative research.	CO 1: Predict the different stages of research process. CO 2: Apply methods to collect best data. CO 3: Assess the suitable research design & work. CO 4: Compare



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				categorical and continuous measures. CO 5: Analyze the process of various reports writing.
19MCAGE22	Data Mining And Data Warehousing	Global	This course provides the basic concepts, principles, methods, implementation techniques and applications of data mining	CO 1: Practice the pre-processing operations of data. CO 2: Compare & contrast OLTP, OLAP and Data mining as techniques for extracting knowledge from a Data Warehouse. CO 3: Perform Association Rule Mining for Market Basket Analysis.



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				<p>CO 4: Design & deploy the appropriate Classification and Clustering techniques.</p> <p>CO 5: Explore the recent trends in data mining.</p>
19MCAGE23	Digital Image Processing	Global	<p>This course provides an introduction to the basic concepts, methodologies and algorithms of digital image processing focusing image enhancement, image analysis and object recognition</p>	<p>CO 1: To review the fundamental concepts of a digital image processing system.</p> <p>CO 2: To examine various types of images, their intensity transformations and spatial filtering.</p> <p>CO 3: To analyze the</p>



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				<p>different types of noises and the filters used to restore and reconstruct the images.</p> <p>CO 4: To create color images and pseudo images with smoothening and sharpening techniques.</p> <p>CO 5: To compare the various lossy and lossless compression mechanisms.</p>
19MCAGE24	Artificial Intelligence & Expert Systems	Global	<p>This course provides the basic principles of artificial intelligence. It will cover problem solving paradigms, constraint</p>	<p>CO 1: Identify problems that are amenable to solution by AI methods.</p> <p>CO 2: Formulate search problems and</p>



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			propagation and search strategies in the areas of applications including knowledge representation, natural language processing, expert systems, vision and robotics	implement search algorithms using admissible heuristics. CO 3: Design and carry out an empirical evaluation of different algorithms on a predicate logic and state the conclusions that the evaluation supports. CO 4: Analyze games playing as adversarial search problems and implement optimal and efficient solutions. CO 5: Apply the concepts of Expert Systems
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				in machine learning
19MCAGE25	Soft Computing	Global	<p>This course provides the principal constituents of soft computing that is fuzzy logic, neural network theory and probabilistic reasoning. The course explores the features that are employed in various associated techniques</p>	<p>CO 1: Explore the functional components of artificial neural networks.</p> <p>CO 2: Examine the principles of back propagation networks.</p> <p>CO 3: Expose the students to the concepts of predicting the functionalities of ART.</p> <p>CO 4: Analyze the logic principle of classical sets and fuzzy set operations in fuzzy set theory.</p> <p>CO 5: Identify the concept of fuzzification and</p>



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				defuzzification involved in various systems
19MCAGE26	Cloud Computing	Global	<p>This course provides comprehensive study of cloud concepts and capabilities across the various Cloud service models including</p> <p>Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), and Business Process as a Service (BPaaS).</p>	<p>CO 1: Compare the strengths and limitations of cloud computing.</p> <p>CO 2: Identify the architecture, infrastructure and delivery models of cloud computing.</p> <p>CO 3: Apply suitable virtualization concept.</p> <p>CO 4: Choose the appropriate Cloud player, Programming Models and approach.</p> <p>CO 5: Address the core issues of cloud computing</p>



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				such as security, privacy and interoperability
19MCAGE27	Advanced Dbms Techniques	Global	This course provides knowledge on the advanced topics of DBMS including query optimization, concurrency, complex queries, transaction management, organization of database systems and advanced indexing.	<p>CO 1: Design the basic concepts of the advanced database design and dependencies.</p> <p>CO 2: Compare the different data models.</p> <p>CO 3: Compile the implementation concepts of storage structures.</p> <p>CO 4: Analyze on the advanced transaction management techniques.</p> <p>CO 5: Discuss on the advanced databases</p>



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20MCAAD01	Data Mining Techniques	Global	This course provides the basic concepts, principles, methods, implementation techniques and applications of data mining.	<p>CO 1: Identify the functionalities of Data Mining and various techniques to extract knowledge.</p> <p>CO 2: Analyze the methods to discover Association Rules</p> <p>CO 3: Design & deploy the appropriate Clustering techniques.</p> <p>CO 4: Outline web mining, temporal and spatial data mining</p> <p>CO 5: Examine and Explore weka techniques</p>
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20MCADA02	Data Analytics And Visualization Using Spreadsheets	Global	This course provides knowledge to perform data analysis using Excel's most popular features.	<p>CO 1: Ability to analyze data is a powerful skill that helps you make better decisions</p> <p>CO 2: Identify the basic principles of a Pivot Table</p> <p>CO 3: Recognize how to use Pivot Table and Pivot chart</p> <p>CO 4: Use Excel's powerful functions to efficiently transform mountains of raw data into clear insights</p> <p>CO 5: Use your new-found Excel skills like Descriptive Statistics and Inferential Statistics</p>
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				to analyze what makes a successful project.
20MCADA03	Big Data Analytics	Global	This course provides familiarization to the important information technologies used in manipulating, storing and analyzing big data	<p>CO 1: Understand the fundamentals of various big data analysis techniques</p> <p>CO 2: Analyze the big data analytic techniques for useful business applications</p> <p>CO3: Examine the HADOOP and Map Reduce technologies associated with big data analytics</p> <p>CO 4: Scrutinize the various storage architecture using HDFS</p>



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				and Map reducing techniques CO5: Understand, Explore and deploy Hbase
20MCADA04	Data Analytics Tools & Techniques	Global	This course provides knowledge on creating applications to analyze big data.	CO 1: Examine the programming constructs of Pig and database management using HiveQL CO 2: Write scripts using Pig latin and perform various HiveQL queries by applying RDBMS concepts CO 3: Apply the concepts of Pig and Hive in simple tasks CO 4: Formulate and analyse different databases



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				for different situations CO 5: Create real time applications
20MCADA05	Business Analytics Using R	Global	This course provides a comprehensive study on business analytics that can be applied to many business settings and its practical implementation using a tool	CO 1: Examine the concepts around Business analytics CO 2: Evaluate the process of analysing a business descriptively using the tool CO 3: Explore data and business analytic process CO 4: Apply various supervised and unsupervised Machine learning techniques CO 5: Learn to apply



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				different algorithms of regression for business problems
20MCADA06	Big Data Security	Global	This course provides an overview of the cutting edge and new technologies in the area of big data security	CO 1: Identify the need for security and best practices in a big data environment CO 2: Analyze the steps to secure big data CO 3: Build security in hadoop eco system CO 4: Assess the sensitivity of data in Hadoop CO 5: Outline data security and event logging
20MCADS01	Data Communication &	Global	This course provides the basic concepts,	CO 1: Identify the functionalities of



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	Networking		design principles and underlying technologies of networking.	Networking layers of both OSI and TCP/IP reference models. CO 2: Analyze the design issues of Datalink layer and techniques to resolve it. CO 3: Compare the principles of Switching and Routing algorithm. CO 4: Predict the TCP and UDP related procedures. CO 5: Outline the Application layer protocols.
20MCADS02	Wireless Communication &	Global	This course provides knowledge on key	CO 1: Identify, Predict and Evaluate MAC, SDMA,



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	Security		mobile system and wireless communication.	<p>TDMA, FDMA, CDMA</p> <p>CO 2: Demonstrate the architectures, challenges and solutions of Wireless communication</p> <p>CO 3: Assess the role of Wireless Networks in shaping the future internet.</p> <p>CO 4: Design Mobile IP to support seamless and continuous Internet connectivity</p> <p>CO 5: Design SIP to create, modify, and terminate a multimedia session over the Internet Protocol</p>
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20MCADS03	Cryptography & Network Security	Global	<p>This course provides basic understanding of previous attacks on cryptosystems with the aim of preventing future attacks and to provide security using various cryptographic tools</p>	<p>CO 1 Evaluate the fundamentals of networks security, security architecture, threats and vulnerabilities</p> <p>CO 2 Compare Stream ciphers and block ciphers.</p> <p>CO 3 Apply the different cryptographic operations of public key cryptography.</p> <p>CO 4 Pertain the various Authentication schemes to simulate different applications.</p> <p>CO 5 Applying CrypTool 2 to encrypt and decrypt texts using different</p>
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				ciphers.
20MCADS04	Cyber Forensics	National	This course provides the investigation of computer-related crimes with the goal of obtaining evidence to be presented in a court of law.	<p>CO 1 Predict the forensics fundamentals and the various technologies used to avoid computer crimes</p> <p>CO 2 Illustrate different methods to collect and preserve digital evidence and Digital Crime Scene.</p> <p>CO 3 Identify and Analyze Forensic Technical Surveillance Devices.</p> <p>CO 4 Evaluate the Various tools and tactics followed in military.</p> <p>CO 5 Demonstrate the Usage of surveillance tools</p>



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				for tracking cyber criminals
20MCADS05	Cloud Security	Global	<p>This course provides a comprehensive study on the unique security challenges and opportunities in cloud platforms and guides through the security best practices for multivendor cloud environments</p>	<p>CO 1 Examine the security threats in cloud platforms</p> <p>CO 2 Evaluate Data Asset and Identity Access Management</p> <p>CO 3 Manage the vulnerable cloud environment</p> <p>CO 4 Understand the security issues that arises over a Network</p> <p>CO 5 Explore the security incidents by detecting, responding and recovering</p>
20MCADS06	High Speed	Global	This course covers	CO 1 Work Identify the



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	Networks		the basics, architectures, protocols and technologies for high-speed networks. It includes LANs, Protocols, TCP/IP Suite, Data Networks, high speed LANs, link level flow and error control, transport level traffic control, routing, MPLS switching and Network security	building blocks and operation of high speed networking and ATM. CO 2Analyze the cause of congestion, traffic slow down and related factors for Quality of Service Identify. CO 3Apply the concepts learnt in this course to optimize performance of high-speed networks using Flow Control. CO 4Compare the different architectures used for HSN. CO 5Describe the protocols
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				that are used to design high speed networks.
20MCAAM01	Artificial Intelligence & Expert Systems	Global	<p>This course provides the basic principles of artificial intelligence. It will cover problem solving paradigms, constraint propagation and search strategies in the areas of applications including knowledge representation, natural language processing, expert systems, vision and robotics.</p>	<p>CO 1: Identify problems that are amenable to solution by AI methods.</p> <p>CO 2: Formulate search problems and implement search algorithms using admissible heuristics.</p> <p>CO 3: Design and carry out an empirical evaluation of different algorithms on a predicate logic and state the conclusions that the</p>



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				<p>evaluation supports.</p> <p>CO 4: Analyze games playing as adversarial search problems and implement optimal and efficient solutions.</p> <p>CO 5: Apply the concepts of Expert Systems in machine learning, Examine and Explore scikit learn techniques</p>
20MCAAM02	Soft Computing	Global	<p>This course provides the principal constituents of soft computing that is fuzzy logic, neural network theory and</p>	<p>CO 1: Explore the functional components of artificial neural networks..</p> <p>CO 2: Examine the principles of back propagation networks.</p>



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			probabilistic reasoning. The course explores the features that are employed in various associated techniques.	<p>CO 3: Expose the students to the concepts of predicting the functionalities of ART.</p> <p>CO 4: Analyze the logic principle of classical sets and fuzzy set operations in fuzzy set theory.</p> <p>CO 5: Identify the concept of fuzzification and defuzzification involved in various systems.</p>
20MCAAM03	Machine Learning	Global	This course provides an introduction to learn Machine Intelligence and Machine Learning	<p>CO 1 Identify the concepts of machine learning</p> <p>CO 2 Demonstrate Decision Tree learning and Bayesian Learning for</p>



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			Applications algorithms to solve real world problems	classification. CO 3Analyze the logic behind Genetic Algorithms. CO 4Compare various set of rules available for Learning. CO 5Propose solution for real world problems based on Inductive and Analytical Learning.
20MCAAM04	Neural Networks	Global	This course provides the basic principles of Neural Networks. It will cover Neuro computing, Layer Perceptron, Pattern Association, HopFiled	CO 1Identify problems that are amenable to solution by Neural networks methods. CO 2Formulate searching rules and implement Single Layer Perceptron and



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			Net, Back Propagation Network, Probabilistic Neural Network and Application of Neural Networks	Multilayer Perceptron Networks. CO 3 Design and carry out an empirical evaluation of different algorithms on Pattern Association CO 4 Analyze Feedback and Feed forward Network and implement optimal and efficient solutions. CO 5 Apply the application of Neural Networks in Arts, Bioinformatics and use of Neural Networks in Knowledge Extraction.
20MCAAM05	Human Computer Interaction	Global	This course introduces the	CO 1 Design effective dialog for HCI



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			fundamental theories and concepts of human computer interaction. It provides knowledge on analyzing interaction problems from a technical, cognitive and functional perspective	CO 2 Design effective HCI for individuals and persons with disabilities CO 3 Assess the importance of user feedback CO 4 Explain the HCI implications for designing websites CO 5 Develop meaningful user interface
20MCAAM06	Deep Learning	Global	The course aims to provide an understanding of different types of Deep Architectures, including	CO 1 Identify problems that are amenable to solution by deep networks CO 2 Formulate convolutional networks and



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			Convolutional Networks and Recurrent Networks.	<p>sequence modelling for problem solving</p> <p>CO 3 Design and carry out an empirical evaluation of autoencoders and representation learning</p> <p>CO 4 Analyze structured probabilistic and Monte Carlo Methods</p> <p>CO 5 Apply the applications of deep learning.</p>
20MCAGE01	Office Automation Tools	Global	This course enable the students in crafting professional word documents, excel spread sheets, power point	<p>CO 1: Identify current and emerging word processing technologies to produce organizational documents</p> <p>CO 2: Develop, open</p>



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			presentations using the Microsoft suite of office tools and also preparation of documents and presentations with office automation tools.	and explore the Microsoft Office Excel environment CO 3: Design and edit charts and graphs with the use of functions and formulas. CO 4: Implement and query a database using different methods CO 5: Generate slide presentations that include text, graphics, animation, and transitions.
20MCAGE02	Financial Management And Accounting	National	This course provides an overview of financial concepts, process and	CO 1: Preparation and analysis of balance sheet. CO 2: Predict the Classification of Costing.



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			operations from a managerial perspective.	CO 3: Decide the budget preparation and control of a company. CO 4: Analyze the flow of funds. CO 5: Use Tally to implement the needs of financial accounting
20MCAGE04	E-Commerce	Global	This course provides information on the combination of Internet with E-Commerce, options available for doing business on the Internet, features that helps to build E-	CO 1: Gain a comprehensive understanding of the E-Commerce landscape, current and emerging technology and infrastructure underpinnings of the business.



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			Commerce web sites, marketing issues, payment options, security issues and customer service.	<p>CO 2: Analyze the impact of E-commerce on business models and strategy.</p> <p>CO 3: Develop an understanding on how internet can help business grow/ Describe the infrastructure for E-commerce</p> <p>CO 4: Assess electronic payment systems</p> <p>CO 5: Gain an understanding on the importance of security, privacy, and ethical issues as they relate to E-</p>
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				Commerce.
20MCAGE05	Ethics Computing	In Global	<p>This course provides the basis for ethical decision-making and the methodology for reaching ethical decisions concerning computing matters</p>	<p>CO 1: Predict the relationship between the law, ethics and computer technology.</p> <p>CO 2: Outline the philosophical and ethical debates with the ideas and the nature of intellectual creativity.</p> <p>CO 3: Design the impact of computer technology on free speech.</p> <p>CO 4: Formulate the ethical and legal issues of the impact that computing</p>



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				technologies had on workplace. CO 5: Develop a personal standpoint in relation to DataBase society and the usage of biometric data.
20MCAGE06	Resource Management Techniques	Global	This course provides solution to problems in different environment that needs decision making using optimization techniques.	CO 1: Identify the applications of Operations Research and methods to solve business problems. CO 2: Apply linear programming to solve operational problem with constraints. CO 3: Apply transportation



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				<p>and assignment models to find optimal solution in warehousing and Travelling,</p> <p>CO 4: Prepare project scheduling using PERT and CPM.</p> <p>CO 5: Use optimization concepts in real world problems</p>
20MCAGE07	Entrepreneurship Development	Global	<p>This course provides the skills necessary to succeed as an entrepreneur. It includes the fundamentals of</p>	<p>CO1: Highlight the salient characteristics of successful entrepreneur</p> <p>CO2: Enumerate the competencies relevant for Entrepreneurial</p>



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			starting and operating a business, developing a business plan, obtaining financing, marketing a product or service and developing an effective accounting system	development. CO3: Delineate the growth of women Entrepreneurship in India. CO4: Identify the major problems faced in conducting EDPs. CO5: Discuss the methods of project appraisal used for small scale enterprises
20MCAGE08	Wireless Sensor Networks	Global	This course provides knowledge on the architectures, functions and performances of wireless sensor systems and	CO 1: Formulate the basic standardization of wireless networks. CO 2: Analyze the implementation of technologies related to



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			platforms. It also describes and analyze the specific requirements for applications in wireless sensor networks regarding energy supply, memory, processing and transmission capacity	WSN. CO 3: Identify and understand the security issues in ad hoc and sensor networks. CO 4: Compare the protocols and to promote the research work in this area. CO 5: Apply and solve problems in the applications of Wireless Networking Area.
20MCAGE09	Research Methodology	Global	This course provides an overview of various methods employed in quantitative and	CO 1: Predict the different stages of research process. CO 2: Apply methods



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			qualitative research.	<p>to collect best data.</p> <p>CO 3: Assess the suitable research design & work.</p> <p>CO 4: Compare categorical and continuous measures.</p> <p>CO 5: Analyze the process of various reports writing.</p>
20MCAGE10	Digital Image Processing	Global	<p>This course provides an introduction to the basic concepts, methodologies and algorithms of digital image processing focusing image enhancement, image</p>	<p>CO 1: To review the fundamental concepts of a digital image processing system.</p> <p>CO 2: To examine various types of images, their intensity transformations and</p>



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			analysis and object recognition	spatial filtering. CO 3: To analyze the different types of noises and the filters used to restore and reconstruct the images. CO 4: To create color images and pseudo images with smoothing and sharpening techniques. CO 5: To compare the various lossy and lossless compression mechanisms.
20MCAGE11	Cloud Computing	Global	This course provides comprehensive study of cloud concepts and capabilities across	CO 1: Compare the strengths and limitations of cloud computing. CO 2: Identify the



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			the various Cloud service models including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), and Business Process as a Service (BPaaS).	architecture, infrastructure and delivery models of cloud computing. CO 3: Apply suitable virtualization concept. CO 4: Choose the appropriate Cloud player, Programming Models and approach. CO 5: Address the core issues of cloud computing such as security, privacy and interoperability
20MCAGE12	Agile Software Engineering	Global	This course provides an immersive experience in the technical, cultural	CO 1 Explain the fundamental principles and practices of the agile development



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			and social aspects of Agile and DevOps.	methods. CO 2 Analyze the planning and execution of the agile manifesto CO 3 Monitor the management to achieve complete product development. CO 4 Practice the integration of development and operations in software projects. CO 5 Present the software
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				project by following the principles that best fit the technical and market demands.
19MCADS03	Data Analytics Using Pig & Hive	Global	This course provides knowledge on creating applications to analyze big data.	<p>CO 1: Outline the programming constructs of Pig and database management using HiveQL</p> <p>CO 2: Write scripts using Pig latin and perform various HiveQLqueries by applying RDBMS concepts</p> <p>CO 3: Apply the</p>



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				<p>concepts of Pig and Hive in simple tasks</p> <p>CO 4: Formulate and analyse different databases for different situations</p> <p>CO 5: Create real time applications</p>
19MCANW03	High Speed Networks	Global	<p>This course covers the basics, architectures, protocols and technologies for high-speed networks. It includes LANs, Protocols, TCP/IP Suite, Data Networks, high speed</p>	<p>CO 1: Identify the building blocks and operation of high speed networking and ATM.</p> <p>CO 2: Analyze the cause of congestion, traffic slow down and related factors for Quality of Service Identify.</p> <p>CO 3: Apply the</p>



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			LANs, link level flow and error control, transport level traffic control, routing, MPLS switching and Network security	<p>concepts learnt in this course to optimize performance of high-speed networks using Flow Control.</p> <p>CO 4: Compare the different architectures used for HSN.</p> <p>CO 5: Describe the protocols that are used to design high speed networks</p>
19MCAAD03	Software Development Frameworks	Global	This course provides an immersive experience in the technical, cultural and social aspects of	<p>CO1: Explain the fundamental principles and practices of the agile development methods.</p> <p>CO2: Analyze the planning</p>



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			Agile and Devops	<p>and execution of the agile manifesto</p> <p>CO3: Monitor the management to achieve complete product development.</p> <p>CO4: Practice the integration of development and operations in software projects.</p> <p>CO5: Present the software project by following the principles that best fit the technical and market demands.</p>
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19MCAGE01	Resource Management Techniques	Global	<p>This course provides solution to problems in different environment that needs decision making using optimization techniques</p>	<p>CO 1: Identify the applications of Operations Research and methods to solve business problems.</p> <p>CO 2: Apply linear programming to solve operational problem with constraints.</p> <p>CO 3: Apply transportation and assignment models to find optimal solution in warehousing and Travelling,</p> <p>CO 4: Prepare project scheduling using PERT and CPM.</p> <p>CO 5: Use</p>
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				optimization concepts in real world problems
19MCAGE02	Financial Management & Accounting	Global	This course provides an overview of financial concepts, process and operations from a managerial perspective.	<p>CO 1: Preparation and analysis of balance sheet.</p> <p>CO 2: Predict the Classification of Costing.</p> <p>CO 3: Decide the budget preparation and control of a company.</p> <p>CO 4: Analyze the flow of funds.</p> <p>CO 5: Use Tally to implement the needs of financial accounting</p>
19MCAGE03	Management	Global	This course provides	CO 1: Analyze and



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	Information Systems		the concept and the role of management information systems to achieve strategic goals and to gain competitive advantages.	<p>synthesize business information needs to facilitate evaluation of strategic alternatives.</p> <p>CO 2: Apply MIS knowledge and skills learned to facilitate development, deployment and management of information systems.</p> <p>CO 3: Predict the use of information technology for business processes.</p> <p>CO 4: Assess the use of technology of Information Systems for effective management.</p>
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				CO 5: Identify the security features and global issues in organization and society
19MCAGE04	E-Commerce	Global	This course provides information on the combination of Internet with E-Commerce, options available for doing business on the Internet, features that helps to build E-Commerce web sites, marketing issues, payment options, security issues and customer service.	<p>CO 1: Gain a comprehensive understanding of the E-Commerce landscape, current and emerging technology and infrastructure underpinnings of the business.</p> <p>CO 2: Analyze the impact of E-commerce on business models and strategy.</p>



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				<p>CO 3: Develop an understanding on how internet can help business grow/ Describe the infrastructure for E-commerce</p> <p>CO 4: Assess electronic payment systems</p> <p>CO 5: Gain an understanding on the importance of security, privacy, and ethical issues as they relate to E-Commerce</p>
19MCAGE05	Cyber Forensics	National	This course provides the investigation of computer-related	CO 1: Predict the forensics fundamentals and the various



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			crimes with the goal of obtaining evidence to be presented in a court of law	technologies used to avoid computer crimes. CO 2: Illustrate different methods to collect and preserve digital evidence and Digital Crime Scene. CO 3: Identify and Analyze Forensic Technical Surveillance Devices. CO 4: Evaluate the Various tools and tactics followed in military. CO 5: Demonstrate the Usage of surveillance tools for tracking cyber criminals
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19MCAGE06	Ethics Computing	in Global	This course provides the basis for ethical decision-making and the methodology for reaching ethical decisions concerning computing matters	COURSE OUTCOMES CO 1: Predict the relationship between the law, ethics and computer technology. CO 2: Outline the philosophical and ethical debates with the ideas and the nature of intellectual creativity. CO 3: Design the impact of computer technology on free speech. CO 4: Formulate the ethical and legal issues of the impact that computing technologies had on
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				workplace. CO 5: Develop a personal standpoint in relation to DataBase society and the usage of biometric data.
19MCAGE07	Entrepreneurship Development	Global	This course provides the skills necessary to succeed as an entrepreneur. It includes the fundamentals of starting and operating a business, developing a business plan, obtaining	CO1: Highlight the salient characteristics of successful entrepreneur CO2: Enumerate the competencies relevant for Entrepreneurial development. CO3: Delineate the growth of women



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			financing, marketing a product or service and developing an effective accounting system	Entrepreneurship in India. CO4: Identify the major problems faced in conducting EDPs. CO5: Discuss the methods of project appraisal used for small scale enterprises.
19MCAGE21	Research Methodology	Global	This course provides an overview of various methods employed in quantitative and qualitative research.	CO 1: Predict the different stages of research process. CO 2: Apply methods to collect best data. CO 3: Assess the suitable research design & work.



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				<p>CO 4: Compare categorical and continuous measures.</p> <p>CO 5: Analyze the process of various reports writing.</p>
19MCAGE22	Data Mining & Data warehousing	Global	<p>This course provides the basic concepts, principles, methods, implementation techniques and applications of data mining.</p>	<p>CO 1: Practice the pre-processing operations of data.</p> <p>CO 2: Compare & contrast OLTP, OLAP and Data mining as techniques for extracting knowledge from a Data</p>



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				<p>Warehouse.</p> <p>CO 3: Perform Association Rule Mining for Market Basket Analysis.</p> <p>CO 4: Design & deploy the appropriate Classification and Clustering techniques.</p> <p>CO 5: Explore the recent trends in data mining.</p>
19MCAGE23	Digital Image Processing	Global	<p>This course provides an introduction to the basic concepts, methodologies and algorithms of digital image processing</p>	<p>CO 1: To review the fundamental concepts of a digital image processing system.</p> <p>CO 2: To examine various types of</p>



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			focusing image enhancement, image analysis and object recognition.	images, their intensity transformations and spatial filtering. CO 3: To analyze the different types of noises and the filters used to restore and reconstruct the images. CO 4: To create color images and pseudo images with smoothening and sharpening techniques. CO 5: To compare the various lossy and lossless
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				compression mechanisms.
19MCAGE24	Artificial Intelligence&Expert Systems	Global	<p>This course provides the basic principles of artificial intelligence. It will cover problem solving paradigms, constraint propagation and search strategies in the areas of applications including knowledge representation, natural language processing, expert systems, vision and</p>	<p>CO 1: Identify problems that are amenable to solution by AI methods.</p> <p>CO 2: Formulate search problems and implement search algorithms using admissible heuristics.</p> <p>CO 3: Design and carry out an empirical evaluation of different algorithms on a predicate logic and state the conclusions that the</p>



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			robotics	evaluation supports. CO 4: Analyze games playing as adversarial search problems and implement optimal and efficient solutions. CO 5: Apply the concepts of Expert Systems in machine learning.
19MCAGE25	Soft Computing	Global	CO 1: Identify problems that are amenable to solution by AI methods. CO 2: Formulate search problems and implement search	CO 1: Explore the functional components of artificial neural networks. CO 2: Examine the principles of back propagation networks.



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			<p>algorithms using admissible heuristics.</p> <p>CO 3: Design and carry out an empirical evaluation of different algorithms on a predicate logic and state the conclusions that the evaluation supports.</p> <p>CO 4: Analyze games playing as adversarial search problems and implement optimal and efficient</p>	<p>CO 3: Expose the students to the concepts of predicting the functionalities of ART.</p> <p>CO 4: Analyze the logic principle of classical sets and fuzzy set operations in fuzzy set theory.</p> <p>CO 5: Identify the concept of fuzzification and defuzzification involved in various systems.</p>
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			solutions. CO 5: Apply the concepts of Expert Systems in machine learning.	
19MCAGE26	Cloud Computing	Global	This course provides comprehensive study of cloud concepts and capabilities across the various Cloud service models including Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a	CO 1: Compare the strengths and limitations of cloud computing. CO 2: Identify the architecture, infrastructure and delivery models of cloud computing. CO 3: Apply suitable virtualization concept. CO 4: Choose the



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			Service (SaaS), and Business Process as a Service (BPaaS).	appropriate Cloud player, Programming Models and approach. CO 5: Address the core issues of cloud computing such as security, privacy and interoperability
19MCAGE27	Advanced DBMS Techniques	Global	This course provides an introduction to the design and creation of relational databases with an examination on the characteristics of PL/SQL and its usage to extend and automate SQL to administer the Oracle	CO 1: Design conceptual models of a database using ER model. CO 2: Outline the features of DBMS and Relational Database design. CO 3: Retrieve information from database by formulating complex



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			database.	SQL Queries. CO 4: Utilize PL/SQL programming to solve problems. CO 5: Implement Packages, Triggers for efficient retrieval of information.
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