



# Fatima College

(Autonomous)

Re-Accredited with 'A++'(CGPA 3.61) by NAAC (Cycle- IV)

College with Potential for Excellence (2004 - 2019)

101 - 150 Rank Band in India Ranking 2021 (NIRF)

Mary Land, Madurai - 625018, Tamil Nadu.



## FATIMA COLLEGE (AUTONOMOUS), MADURAI – 625018

2020 - 2021

### CRITERION 1 - CURRICULAR ASPECTS

**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 CODE : MCA**

### PROGRAMME OUTCOMES:

<b>PO 1</b>	Apply the knowledge of computing maths and science for the solution of problems and requirements
<b>PO 2</b>	Identify, critically analyze, formulate and develop computer applications using fundamental principles of relevant domain disciplines
<b>PO 3</b>	Design and evaluate solutions for computer based problems to meet the desired needs within realistic constraints such as safety, security and applicability



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<b>PO 4</b>	Use research based knowledge to conduct experiments and interpret data to attain well-defined conclusions.
<b>PO 5</b>	Create, select and apply modern computing tools by understanding the limitations, with dexterity.
<b>PO6</b>	Demonstrate the competency in programming skills as per industry expectations.
<b>PO7</b>	Understand the impact of system solutions in societal, environmental and cultural issues within local and global contexts for sustainable development
<b>PO8</b>	Commit to professional ethics and cyber regulations, responsibilities & norms.
<b>PO9</b>	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary environment to manage projects.
<b>PO10</b>	Communicate effectively with the society about computing technologies.
<b>PO11</b>	Demonstrate knowledge and understanding of the management principles and apply these to manage projects.
<b>PO12</b>	Appreciate the importance of goal setting and to recognize the need for life-long learning in the broadest context of technological change.



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## PROGRAMME SPECIFIC OUTCOMES:

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



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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.	<p><b>CO 1:</b> Perform Logical operations and predicate calculus needed for computing skill.</p> <p><b>CO2:</b> Analyze and Compare the various techniques for solving numerical equations.</p> <p><b>CO3:</b> Apply the techniques of statistics and numerical methods to unravel problems by computers.</p> <p><b>CO4:</b> Explain the set theory logic.</p>



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				<b>CO 5:</b> Utilize the Knowledge of matrices for designing and solving problems
20MCA202	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 application with appropriate tools	<b>CO 1:</b> Compare the different domains and process models. <b>CO 2:</b> Identify the data, class and flow oriented modelling concepts. <b>CO 3:</b> Analyze on the design oriented concepts. <b>CO 4:</b> Identify the managerial aspects of software development. <b>CO 5:</b> Generate project schedule for different activities of software development



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20MCA103	OPERATING SYSTEMS	Global	This course provides knowledge on the concepts of abstraction, scheduling mechanisms, implementations and manages a computer's resources, especially the allocation of those resources among other programmes	<b>CO 1:</b> Identify the components and processes. <b>CO 2:</b> Analyze on scheduling algorithms and deadlocks. <b>CO 3:</b> Demonstrate the mapping between the physical memory and virtual memory. <b>CO 4:</b> Identify the secondary memory management techniques. <b>CO 5:</b> Analyze on the distributed systems and security issues.
20MCA104	PROGTRAMMING IN PYTHON	Global	This course provides the basics of writing and running Python scripts to more	<b>CO 1:</b> Predict the basics of Python programming. <b>CO 2:</b> Solve problems requiring the



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			advanced features such as file operations, regular expressions, working with OOPs concept 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	writing of well-documented programs in the Python language, including use of the logical constructs of that language. <b>CO 3:</b> Use and manipulate Lists and python exception handling model to develop robust programs. <b>CO 4:</b> Formulate solutions for String, tuples and File operations. <b>CO 5:</b> Apply object-oriented programming concepts to develop dynamic interactive Python applications
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20MCA105	LAB I – PYTHON PROGRAMMING	Global	This course provides the practical knowledge of implementing Python programs with loops, functions and represent compound data using lists, tuples and dictionaries.	<b>CO 1:</b> Implement Math functions, Strings, List and Tuple in Python programs. <b>CO 2:</b> Express different Decision Making statements and Functions. <b>CO 3:</b> 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	<b>CO 1:</b> Enhance Programming skills and techniques. <b>CO 2:</b> Formulate complex queries using SQL <b>CO 3:</b> Use the PL/SQL code constructs of IF-THEN-ELSE and LOOP





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			procedure perspective. This also includes implementation of Subprograms, Triggers, and Cursors concepts in depth	types as well as syntax and command functions.
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.	<b>CO 1:</b> Use Linux utilities and develop shell scripts to perform tasks. <b>CO 2:</b> Effectively use Linux environment to accomplish software development tasks. <b>CO 3:</b> Monitor system performance and network activities.



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			Specific emphasis is given to the bash shell and user environment 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.	<b>CO 1:</b> Display competence in oral and written communication. <b>CO 2:</b> Use current technology related to the communication.



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20MCA201	DATA STRUCTURES AND ALGORITHMS	Global	This course provides 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.	<b>CO 1:</b> Select appropriate data structures as applied to specified problem definition. <b>CO 2:</b> Implement operations like searching, insertion, deletion and traversing in trees. <b>CO 3:</b> Compare the data structures of advanced search trees. <b>CO 4:</b> Implement appropriate heap operations, sorting, searching techniques for a given problem. <b>CO 5:</b> Determine and analyze the complexity of graph Algorithms.



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20MCA202	WEB TECHNOLOGIES	Global	This course provides the student with foundational programming knowledge and skills for application development on the Internet.	<p><b>CO 1:</b> Use knowledge of HTML and CSS to create personal and/or business websites</p> <p><b>CO 2:</b> Create effective scripts using JavaScript and jQuery to enhance the end user experience.</p> <p><b>CO 3:</b> Write PHP scripts to handle HTML forms.</p> <p><b>CO 4:</b> Test, debug, and deploy web pages containing PHP and MySQL.</p> <p><b>CO 5:</b> Implement SQL language, JavaScript, Ajax, JQuery, PHP and CSS in the project.</p>
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20MCA203	PROGRAMMING IN JAVA	Global	This course provides an exhaustive coverage of Core Java programming language features like OOPS and GUI programming.	<b>CO 1:</b> Apply the basic Java constructs to develop solutions to real time problems. <b>CO 2:</b> Analyze the hierarchy of java classes to develop object oriented programs. <b>CO 3:</b> Design software in Java using Packages and Threads. <b>CO 4:</b> Implement Concepts of AWT for creating GUI. <b>CO 5:</b> Design a Software using JDBC.
20MCA204	LAB III – WEB TECHNOLOGIES	Global	This course provides information about two powerful technologies. Together, these two	<b>CO 1:</b> Design WebPages using server side scripting. <b>CO 2:</b> Use PHP built-in functions and



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			technologies provide a powerful platform for building database-driven Web applications.	custom functions for processing. <b>CO 3:</b> Create various interactive and dynamic websites
20MCA205	LAB IV – JAVA PROGRAMMING	Global	This course provides experiential learning in the implementation of Core Java Programming.	<b>CO 1:</b> Apply the basic Java constructs to develop solutions to real time problems. <b>CO 2:</b> Analyze the hierarchy of java classes to develop object oriented programs. <b>CO 3:</b> Design software in Java using Packages and Threads. <b>CO 4:</b> Implement Concepts of AWT for creating GUI.



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				<b>CO 5:</b> Design a 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.	<b>CO 1:</b> Demonstrate the practical application of R programming tool. <b>CO 2:</b> 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 connect with the technical environment in which	<b>CO 1:</b> Apply quantitative techniques to solve variety of problems. <b>CO 2:</b> Enhance the technical skills for employability.



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			they operate. It makes them think critically and apply basic mathematics skills to interpret data, draw conclusions and solve problems.	
19MCA301	GRAPH THEORY	Global	This course provides a basic knowlwdge of the structure of graphs and the techniques used to analyze problems in graph theory.	<b>CO 1:</b> Write precise & accurate mathematical definitions of graph theory <b>CO 2:</b> Apply the principles and concepts of graph theory in practical situations. <b>CO 3:</b> Solve the problems using the concepts of Graphs and trees.





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				<b>CO 4:</b> Validate and critically assess a mathematical proof. <b>CO 5:</b> Explore the modern applications of graph theory
19MCA302	DATA COMMUNICATION AND NETWORKING	Global	This course provides the basic concepts, design principles and underlying technologies of networking.	<b>CO 1:</b> Identify the functionalities of Networking layers of both OSI and TCP/IP reference models. <b>CO 2:</b> Analyze the design issues of Datalink layer and techniques to resolve it. <b>CO 3:</b> Compare the principles of Switching and Routing algorithm. <b>CO 4:</b> Predict the TCP and UDP related procedures.



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				<b>CO 5:</b> Outline the Application layer protocols.
19MCA303	PROGRAMMING IN JAVA	Global	This course provides an exhaustive coverage of Core Java programming language features like OOPS and GUI programming.	<b>CO 1:</b> Apply the basic Java constructs to develop solutions to real time problems. <b>CO 2:</b> Analyze the hierarchy of java classes to develop object oriented programs. <b>CO 3:</b> Design software in Java using Packages and Threads. <b>CO 4:</b> Implement Concepts of AWT for creating GUI. <b>CO 5:</b> Design a Software using JDBC.



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19MCA304	LAB V – PHP & MYSQL	Global	This course provides information about two powerful technologies. Together, these two technologies provide a powerful platform for building database-driven Web applications	<b>CO 1:</b> Design WebPages using server side scripting. <b>CO 2:</b> Use PHP built-in functions and custom functions for processing. <b>CO 3:</b> Create various interactive and dynamic websites
19MCA305	LAB VI – JAVA PROGRAMMING	Global	This course provides experiential learning in the implementation of Core Java Programming.	<b>CO 1:</b> Apply the basic Java constructs to develop solutions to real time problems. <b>CO 2:</b> Analyze the hierarchy of java classes to develop object oriented programs.



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				<b>CO 3:</b> Design software in Java using Packages and Threads. <b>CO 4:</b> Implement Concepts of AWT for creating GUI. <b>CO 5:</b> Design a Software using JDBC.
19MCA306	NETWORKING TOOLS	Global	This course provides a dependable and realistic experience to simulate wired and wireless networks.	<b>CO1:</b> To implement wired and wireless networks. <b>CO2:</b> To analyze various protocols in wired and wireless environment
19MCA307	QUANTITATIVE APTITUDE	National	This course provides gamut of skills which facilitate the students to enhance their	<b>CO 1:</b> Apply quantitative techniques to solve variety of problems. <b>CO 2:</b> Perform statistical analysis to



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			employability quotient and do well in the professional space. It makes them think critically and apply basic mathematics skills to interpret data, draw conclusions and solve problems	interpret information
19MCA401	COMPILER DESIGN	Global	The course provides knowledge on the theory and tools that can be employed in order to perform syntax-directed translation of a high-	<b>CO1:</b> To analyze the basic concepts and applications of Compiler Design <b>CO2:</b> To compare various lexical analysers and grammars <b>CO3:</b> To formulate the conversion process between finite automata,



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			level programming language into an executable code along with data flows. The concepts covered are Parsing, Scanning, Semantic Analysis, and Code Generation combined with the theory of computation conversions.	regular grammars with the transition and transformation methods <b>CO4:</b> To demonstrate the knowledge of formal connection and relationship to expressions and languages <b>CO5:</b> To identify if a language is regular, context-free, unambiguous after reducing it to normal forms
19MCA402	MOBILE COMMUNICATION & APPLICATION DEVELOPMENT	Global	This course provides knowledge on key mobile system and wireless communication. It also	<b>CO1:</b> Identify, Predict and Evaluate Wireless Communication Protocols <b>CO2:</b> Compare and analyze various multiplexing techniques in



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			aims at developing applications using Android	mobile environment. <b>C03:</b> Demonstrate the architectures, challenges and solutions of Wireless communication. <b>C04:</b> Assess the role of Wireless Networks in shaping the future internet. <b>C05:</b> Design and develop apps for mobiles using Android. <b>C06:</b> Apply Location Based Services of Android for ensuring women's safety and security
19MCA403	PROGRAMMING IN PYTHON	Global	This course provides the basics of writing and running Python	<b>CO 1:</b> Predict the basics of Python programming. <b>CO 2:</b> Solve problems requiring the



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			scripts to more advanced features such as file operations, regular expressions, working with OOPs concept 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	writing of well-documented programs in the Python language, including use of the logical constructs of that language. <b>CO 3:</b> Use and manipulate Lists and python exception handling model to develop robust programs. <b>CO 4:</b> Formulate solutions for String, tuples and File operations. <b>CO 5:</b> Apply object-oriented programming concepts to develop dynamic interactive Python applications
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MCA404	LAB VII - MOBILE APPLICATION DEVELOPMENT	Global	This course provides knowledge of developing applications for mobiles using native and hybrid frameworks.	<b>CO 1:</b> Install and configure Android application development tools. <b>CO 2:</b> Design and develop user Interfaces for the Android platform. <b>CO 3:</b> Apply Java programming concepts to Android application development. <b>CO 4:</b> Familiar with technology and business trends impacting mobile applications.
MCA405	LAB VIII – PYTHON PROGRAMMING	Global	This course provides the practical knowledge of	<b>CO 1:</b> Implement Math functions, Strings, List and Tuple in



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			implementing Pythonprograms with loops, functions and represent compound data using lists, tuples and dictionaries.	Python programs.  <b>CO 2:</b> Express different Decision Making statements and Functions.  <b>CO 3:</b> Interpret Object oriented programming in Python & File handling operations
19MCA406	SOFTWARE TESTING TOOLS	Global	This course provides focus on the needs of automated testing tools. The testing tactics of a project are done by understanding the customer's requirements, test plan	<b>CO 1:</b> Finding defects in the programs while developing the software.  <b>CO 2:</b> Able to write test cases and test scenarios.  <b>CO 3:</b> Develop the scripts for finding the defects and preventing them.  <b>CO 4:</b> Understand the automated



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			ning, test design scenarios, test cases, test execution, result analysis, defect tracking and reporting	testing tools available
19MCA407	TECHNICAL APTITUDE	National	This course provides skills that are imperative for students to establish a stronger connect with the technical environment in which they operate. An understanding of these skills will enable students to manage the placement	<b>CO 1:</b> Enhance the technical skills for employability. <b>CO 2:</b> Improve the proficiency of participation in competitive examinations



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			challenges more effectively	
19MCA501	SOFTWARE PROJECT MANAGEMENT	Global	This course provides knowledge in applying different techniques to monitor & control project and people	<p><b>CO 1:</b> Deliver successful software projects that support organization's strategic goals</p> <p><b>CO 2:</b> Match organizational needs to the most effective software development model</p> <p><b>CO 3:</b> Plan and manage projects at each stage of the software development life cycle</p> <p><b>CO 4:</b> Create project plans that address real-world management challenges</p> <p><b>CO 5:</b> Develop the skills for tracking</p>



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				and controlling software deliverables  <b>CO 6:</b> 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.	<b>CO1:</b> Identify the concepts of machine learning.  <b>CO2:</b> Demonstrate the supervised and unsupervised learning algorithms for classification, prediction and clustering.  <b>CO3:</b> Analyze the logic behind the execution of various classifiers.  <b>CO4:</b> Compare the performance of



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				different algorithms available for mining data. <b>CO5:</b> Propose solution for real world problems
19MCA503	ENTERPRISE APPLICATION DEVELOPMENT	Global	This course provides exposure to different frameworks namely, Struts, Hibernate, Spring and Django. This collective information supports the learner for developing advanced enterprise applications.	<b>CO1:</b> Develop dynamic web applications using MVC <b>CO2:</b> Use dependency injection & inversion of control in developing Spring project <b>CO3:</b> Create the Struts classes and use MVC design pattern for creating large web applications <b>CO4:</b> Map Java classes and object associations to relational database tables with Hibernate



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				mapping files  <b>CO5:</b> 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	<b>CO1:</b> Demonstrate the concept of classification & clustering in Python  <b>CO2:</b> Analyse and Evaluate the models built.  <b>CO3:</b> Create classification and clustering models using sci-kit learn.
19MCA505	LAB X – ENTERPRISE	Global	This lab course provides the experience	<b>CO 1:</b> Perform Database operations for



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	APPLICATION DEVELOPMENT		in creating, debugging, testing & deploying dynamic web applications. It also gives thorough coverage of the use of MVC for creating web applications.	web applications using MVC <b>CO 2:</b> Develop database application using Spring JDBC/Struts with CURD functionality. <b>CO 3:</b> 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 statistical analysis in R.	<b>CO 1:</b> Demonstrate the practical application of R programming tool. <b>CO 2:</b> Emphasize the implementation of statistical operations in R
19MCA507	INTERPERSONAL SKILLS FOR	National	This course provides the skills needed to	<b>CO 1:</b> Outline the roles played in workgroups and teams





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	CORPORATE READINESS		find a job and also the skills needed to excel at the time of entering a career.	<b>CO 2:</b> 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 sensors.	<b>CO 1:</b> Identify the Fundamentals of Internet of Things. <b>CO 2:</b> Design a portable IoT using relevant protocols. <b>CO 3:</b> Analyze applications of IoT in real time scenario. <b>CO 4:</b> Develop web services to access/control IoT devices. <b>CO 5:</b> Deploy an IoT application and connect to the cloud



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19MCADS 01	BIG DATA ANALYTICS	Global	This course provides familiarization to the important information technologies used in manipulating, storing and analyzing big data.	<b>CO 1:</b> Work with big data platform and Understand the fundamentals of various big data analysis techniques <b>CO 2:</b> Analyze the big data analytic techniques for useful business applications. <b>CO 3:</b> Design efficient algorithms for mining the data from large volumes. <b>CO 4:</b> Examine the HADOOP and Map Reduce technologies associated with big data analytics <b>CO 5:</b> Explore the applications of Big Data
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19MCADS 02	BIG DATA SECURITY	Global	This course provides an overview of the cutting edge and new technologies in the area of big data security.	<b>CO 1:</b> Identify the need for security and best practices in a big data environment <b>CO 2:</b> Analyze the steps to secure big data <b>CO 3:</b> Build security in hadoop eco system <b>CO 4:</b> Assess the sensitivity of data in Hadoop <b>CO 5:</b> Outline data security and event logging
19MCADS 03	DATA ANALYTICS USING PIG AND HIVE	Global	This course provides knowledge on creating applications to analyze	<b>CO 1:</b> Outline the programming constructs of Pig and database management using HiveQL



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			big data.	<b>CO 2:</b> Write scripts using Pig latin and perform various HiveQLqueries by applying RDBMS concepts <b>CO 3:</b> Apply the concepts of Pig and Hive in simple tasks <b>CO 4:</b> Formulate and analyse different databases for different situations <b>CO 5:</b> Create real time applications
19MCANW 01	CRYPTOGRAPHY AND NETWORK SECURITY	Global	This course provides basic understanding of previous attacks on cryptosystems with the aim of preventing future attacks and to provide security using	<b>CO 1:</b> Evaluate the fundamentals of networks security, security architecture, threats and vulnerabilities. <b>CO 2:</b> Compare Stream ciphers and block ciphers. <b>CO 3:</b> Apply the different cryptographic



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			various cryptographic tools	<p>operations of public key cryptography.</p> <p><b>CO 4:</b> Pertain the various Authentication schemes to simulate different applications.</p> <p><b>CO 5:</b> Analyze various Security practices and System security standards</p>
19MCANW 02	WIRELESS SENSOR NETWORKS	Global	This course provides knowledge on the architectures, functions and performances of wireless sensor systems and platforms.	<p><b>CO 1:</b> Formulate the basic standardization of wireless networks.</p> <p><b>CO 2:</b> Analyze the implementation of technologies related to WSN.</p> <p><b>CO 3:</b> Identify and understand the security issues in ad hoc and</p>



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			It also describes and analyze the specific requirements for applications in wireless sensor networks regarding energy supply, memory, processing and transmission capacity	<p>sensor networks.</p> <p><b>CO 4:</b> Compare the protocols and to promote the research work in this area.</p> <p><b>CO 5:</b> Apply and solve problems in the applications of Wireless Networking Area.</p>
19MCANW 03	HIGH SPEED NETWORKS	Global	This course covers the basics, architectures, protocols and technologies for high-speed networks. It includes LANs, Protocols, TCP/IP	<p><b>CO 1:</b> Identify the building blocks and operation of high speed networking and ATM.</p> <p><b>CO 2:</b> Analyze the cause of congestion, traffic slow down and related factors for Quality of Service</p>



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			Suite, Data Networks, high speed LANs, link level flow and error control, transport level traffic control, routing, MPLS switching and Network security.	Identify. <b>CO 3:</b> Apply the concepts learnt in this course to optimize performance of high-speed networks using Flow Control. <b>CO 4:</b> Compare the different architectures used for HSN. <b>CO 5:</b> Describe the protocols that are used to design high speed networks.
19MCAAD 01	WEB PROGRAMMING TECHNIQUES	Global	This course focuses on the two broad divisions of web development, front-end and back-end development. It	<b>CO 1:</b> Understand the basics of HTML tags. <b>CO 2:</b> Analyze the advanced features of HTML5. <b>CO 3:</b> Implement the use of internal



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			gives information on how to load a web application, design and how to interact with web pages using HTML, CSS and JavaScript	and external Cascading Style Sheets (CSS) to format elements on single or group of pages.  <b>CO 4:</b> Compose programs for the web and other contexts using the JavaScript programming language.  <b>CO 5:</b> Apply various ECMAScript 6 methods in building interactive websites.
19MCAAD 02	INTERNET PROGRAMMING FRAMEWORKS	Global	This course provides an overview of client-side web UI frameworks of	<b>CO 1:</b> Analyze React Components, the building blocks and its interaction with other web applications.





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			Bootstrap 4. 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><b>CO 2:</b>Design websites using various Angular features including directives, components and services.</p> <p><b>CO 3:</b>Compute and build applications using Node.JS along with the combination of Bootstrap.</p> <p><b>CO 4:</b>Apply the concepts of MongoDB &amp; MySQL, the back-end databases.</p> <p><b>CO 5:</b>Utilize the conceptual and practical aspects of CSS Pre-processors and JSON</p>
19MCAAD 03	SOFTWARE DEVELOPMENT	Global	This course provides an immersive	<b>CO1:</b> Explain the fundamental principles and practices of the



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	FRAMEWORKS		experience in the technical, cultural and social aspects of Agile and Devops.	<p>agile development methods.</p> <p><b>CO2:</b> Analyze the planning and execution of the agile manifesto</p> <p><b>CO3:</b> Monitor the management to achieve complete product development.</p> <p><b>CO4:</b> Practice the integration of development and operations in software projects.</p> <p><b>CO5:</b> Present the software project by following the principles that best fit the technical and market demands</p>
19MCAGE 01	RESOURCE MANAGEMENT	Global	This course provides solution to problems in	<b>CO 1:</b> Identify the applications of Operations Research and



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	TECHNIQUES		different environment that needs decision making using optimization techniques.	methods to solve business problems. <b>CO 2:</b> Apply linear programming to solve operational problem with constraints. <b>CO 3:</b> Apply transportation and assignment models to find optimal solution in warehousing and Travelling, <b>CO 4:</b> Prepare project scheduling using PERT and CPM. <b>CO 5:</b> Use optimization concepts in real world problems
19MCAGE 02	FINANCIAL MANAGEMENT AND	Global	This course provides an overview of financial	<b>CO 1:</b> Preparation and analysis of balance sheet.



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	ACCOUNTING		concepts, process and operations from a managerial perspective.	<p><b>CO 2:</b> Predict the Classification of Costing.</p> <p><b>CO 3:</b> Decide the budget preparation and control of a company.</p> <p><b>CO 4:</b> Analyze the flow of funds.</p> <p><b>CO 5:</b> Use Tally to implement the needs of financial accounting</p>
19MCAGE 03	MANAGEMENT INFORMATION SYSTEMS	National	This course provides the concept and the role of management information systems to achieve strategic goals and to gain competitive advantages	<p><b>CO 1:</b> Analyze and synthesize business information needs to facilitate evaluation of strategic alternatives.</p> <p><b>CO 2:</b> Apply MIS knowledge and skills learned to facilitate development, deployment and management of information</p>



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				<p>systems.</p> <p><b>CO 3:</b> Predict the use of information technology for business processes.</p> <p><b>CO 4:</b> Assess the use of technology of Information Systems for effective management.</p> <p><b>CO 5:</b> Identify the security features and global issues in organization and society</p>
19MCAGE 04	E-COMMERCE	Global	This course provides information on the combination of Internet with E-Commerce, options available for	<p><b>CO 1:</b> Gain a comprehensive understanding of the E-Commerce landscape, current and emerging technology and infrastructure underpinnings of</p>



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			doing business on the Internet, features that helps to build E-Commerce web sites, marketing issues, payment options, security issues and customer service.	<p>the business.</p> <p><b>CO 2:</b>Analyze the impact of E-commerce on business models and strategy.</p> <p><b>CO 3:</b>Develop an understanding on how internet can help business grow/ Describe the infrastructure for E-commerce</p> <p><b>CO 4:</b>Assess electronic payment systems</p> <p><b>CO 5:</b>Gain an understanding on the importance of security, privacy, and ethical issues as they relate to E-Commerce.</p>
19MCAGE	CYBER FORENSICS	Global	This course provides	<b>CO 1:</b> Predict the forensics



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05			the investigation of computer-related crimes with the goal of obtaining evidence to be presented in a court of law	<p>fundamentals and the various technologies used to avoid computer crimes.</p> <p><b>CO 2:</b> Illustrate different methods to collect and preserve digital evidence and Digital Crime Scene.</p> <p><b>CO 3:</b> Identify and Analyze Forensic Technical Surveillance Devices.</p> <p><b>CO 4:</b> Evaluate the Various tools and tactics followed in military.</p> <p><b>CO 5:</b> Demonstrate the Usage of surveillance tools for tracking cyber criminals</p>
19MCAGE	ETHICS IN	Global	This course provides the basis for ethical	<b>CO 1:</b> Predict the relationship between the law, ethics and computer



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06	COMPUTING		decision-making and the methodology for reaching ethical decisions concerning computing matters	<p>technology.</p> <p><b>CO 2:</b> Outline the philosophical and ethical debates with the ideas and the nature of intellectual creativity.</p> <p><b>CO 3:</b> Design the impact of computer technology on free speech.</p> <p><b>CO 4:</b> Formulate the ethical and legal issues of the impact that computing technologies had on workplace.</p> <p><b>CO 5:</b> Develop a personal standpoint in relation to Data Base society and the usage of biometric data.</p>
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19MCAGE 07	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 financing, marketing a product or service and developing an effective accounting system	<b>CO1:</b> Highlight the salient characteristics of successful entrepreneur <b>CO2:</b> Enumerate the competencies relevant for Entrepreneurial development. <b>CO3:</b> Delineate the growth of women Entrepreneurship in India. <b>CO4:</b> Identify the major problems faced in conducting EDPs. <b>CO5:</b> Discuss the methods of project appraisal used for small scale enterprises
19MCAGE	RESEARCH	Global	This course provides an overview of various	<b>CO 1:</b> Predict the different stages of



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21	METHODOLOGY		methods employed in quantitative and qualitative research.	<p>research process.</p> <p><b>CO 2:</b>Apply methods to collect best data.</p> <p><b>CO 3:</b>Assess the suitable research design &amp; work.</p> <p><b>CO 4:</b>Compare categorical and continuous measures.</p> <p><b>CO 5:</b> Analyze the process of various reports writing.</p>
19MCAGE 22	DATA MINING AND DATA WAREHOUSING	Global	This course provides the basic concepts, principles, methods, implementation techniques and applications of data	<p><b>CO 1:</b>Practice the pre-processing operations of data.</p> <p><b>CO 2:</b>Compare &amp; contrast OLTP, OLAP and Data mining as techniques for extracting knowledge from a Data</p>



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			mining	<p>Warehouse.</p> <p><b>CO 3:</b> Perform Association Rule Mining for Market Basket Analysis.</p> <p><b>CO 4:</b> Design &amp; deploy the appropriate Classification and Clustering techniques.</p> <p><b>CO 5:</b> Explore the recent trends in data mining.</p>
19MCAGE 23	DIGITAL IMAGE PROCESSING	Global	This course provides an introduction to the basic concepts, methodologies and algorithms of digital image processing focusing image	<p><b>CO 1:</b> To review the fundamental concepts of a digital image processing system.</p> <p><b>CO 2:</b> To examine various types of images, their intensity transformations and spatial filtering.</p>



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			enhancement, image analysis and object recognition	<p><b>CO 3:</b>To analyze the different types of noises and the filters used to restore and reconstruct the images.</p> <p><b>CO 4:</b>To create colour images and pseudo images with smoothening and sharpening techniques.</p> <p><b>CO 5:</b>To compare the various lossy and lossless compression mechanisms.</p>
19MCAGE 24	ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS	Global	This course provides the basic principles of artificial intelligence. It will cover problem	<p><b>CO 1:</b>Identify problems that are amenable to solution by AI methods.</p> <p><b>CO 2:</b>Formulate search problems and</p>



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			solving paradigms, constraint propagation and search strategies in the areas of applications including knowledge representation, natural language processing, expert systems, vision and robotics	<p>implement search algorithms using admissible heuristics.</p> <p><b>CO 3:</b>Design and carry out an empirical evaluation of different algorithms on a predicate logic and state the conclusions that the evaluation supports.</p> <p><b>CO 4:</b>Analyze games playing as adversarial search problems and implement optimal and efficient solutions.</p> <p><b>CO 5:</b>Apply the concepts of Expert Systems in machine learning</p>
19MCAGE 25	SOFT COMPUTING	Global	This course provides the principal	<b>CO 1:</b> Explore the functional components of artificial neural



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			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	networks. <b>CO 2:</b> Examine the principles of back propagation networks. <b>CO 3:</b> Expose the students to the concepts of predicting the functionalities of ART. <b>CO 4:</b> Analyze the logic principle of classical sets and fuzzy set operations in fuzzy set theory. <b>CO 5:</b> Identify the concept of fuzzification and defuzzification involved in various systems
19MCAGE 26	CLOUD COMPUTING	Global	This course provides comprehensive study of cloud concepts and	<b>CO 1:</b> Compare the strengths and limitations of cloud computing. <b>CO 2:</b> Identify the architecture,



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			capabilities across 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).	<p>infrastructure and delivery models of cloud computing.</p> <p><b>CO 3:</b>Apply suitable virtualization concept.</p> <p><b>CO 4:</b>Choose the appropriate Cloud player, Programming Models and approach.</p> <p><b>CO 5:</b>Address the core issues of cloud computing such as security, privacy and interoperability</p>
19MCAGE 27	ADVANCED DBMS TECHNIQUES	Global	This course provides knowledge on the advanced topics of DBMS including query optimization,	<p><b>CO 1:</b>Design the basic concepts of the advanced database design and dependencies.</p> <p><b>CO 2:</b>Compare the different data models.</p>



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			concurrency, complex queries, transaction management, organization of database systems and advanced indexing.	<b>CO 3:</b> Compile the implementation concepts of storage structures. <b>CO 4:</b> Analyze on the advanced transaction management techniques. <b>CO 5:</b> Discuss on the advanced databases
20MCAAD 01	DATA MINING TECHNIQUES	Global	This course provides the basic concepts, principles, methods, implementation techniques and applications of data mining.	<b>CO 1:</b> Identify the functionalities of Data Mining and various techniques to extract knowledge. <b>CO 2:</b> Analyze the methods to discover Association Rules <b>CO 3:</b> Design & deploy the appropriate Clustering techniques. <b>CO 4:</b> Outline web mining, temporal





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				and spatial data mining <b>CO 5:</b> Examine and Explore weka techniques
20MCADA 02	DATA ANALYTICS AND VISUALIZATION USING SPREADSHEETS	Global	This course provides knowledge to perform data analysis using Excel's most popular features.	CO 1: Ability to analyze data is a powerful skill that helps you make better decisions CO 2: Identify the basic principles of a Pivot Table CO 3: Recognize how to use Pivot Table and Pivot chart CO 4: Use Excel's powerful functions to efficiently transform mountains of raw data into clear insights CO 5: Use your new-found Excel skills



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				like Descriptive Statistics and Inferential Statistics to analyze what makes a successful project.
20MCADS 01	DATA COMMUNICATION & NETWORKING	Global	This course provides the basic concepts, design principles and underlying technologies of networking.	CO 1: Identify the functionalities of 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.



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				CO 5: Outline the Application layer protocols.
20MCADS 02	WIRELESS COMMUNICATION & SECURITY	Global	This course provides knowledge on key mobile system and wireless communication.	<b>CO 1:</b> Identify, Predict and Evaluate MAC, SDMA, TDMA, FDMA, CDMA <b>CO 2:</b> Demonstrate the architectures, challenges and solutions of Wireless communication <b>CO 3:</b> Assess the role of Wireless Networks in shaping the future internet. <b>CO 4:</b> Design Mobile IP to support seamless and continuous Internet connectivity <b>CO 5:</b> Design SIP to create, modify,



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				and terminate a multimedia session over the Internet Protocol
20MCAAM 01	ARTIFICIAL INTELLIGENCE & EXPERT SYSTEMS	Global	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	<p><b>CO 1:</b>Identify problems that are amenable to solution by AI methods.</p> <p><b>CO 2:</b>Formulate search problems and implement search algorithms using admissible heuristics.</p> <p><b>CO 3:</b>Design and carry out an empirical evaluation of different algorithms on a predicate logic and state the conclusions that the evaluation supports.</p> <p><b>CO 4:</b>Analyze games playing as</p>



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			and robotics.	adversarial search problems and implement optimal and efficient solutions.  <b>CO 5:</b> Apply the concepts of Expert Systems in machine learning, Examine and Explore scikit learn techniques
20MCAAM 02	SOFT COMPUTING	Global	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	<b>CO 1:</b> Explore the functional components of artificial neural networks..  <b>CO 2:</b> Examine the principles of back propagation networks.  <b>CO 3:</b> Expose the students to the concepts of predicting the functionalities of ART.



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			employed in various associated techniques.	<b>CO 4:</b> Analyze the logic principle of classical sets and fuzzy set operations in fuzzy set theory.  <b>CO 5:</b> Identify the concept of fuzzification and defuzzification involved in various systems.
20MCAGE 01	OFFICE AUTOMATION TOOLS	Global	This course enable the students in crafting professional word documents, excel spread sheets, power point presentations using the Microsoft suite of office tools and also preparation of documents and	<b>CO 1:</b> Identify current and emerging word processing technologies to produce organizational documents  <b>CO 2:</b> Develop, open and explore the Microsoft office Excel environment  <b>CO 3:</b> Design and edit charts and graphs with the use of functions



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			presentations with office automation tools.	and formulas. <b>CO 4:</b> Implement and query a database using different methods <b>CO 5:</b> Generate slide presentations that include text, graphics, animation, and transitions.
20MCAGE 02	FINANCIAL MANAGEMENT AND ACCOUNTING	National	This course provides an overview of financial concepts, process and operations from a managerial perspective.	<b>CO 1:</b> Preparation and analysis of balance sheet. <b>CO 2:</b> Predict the Classification of Costing. <b>CO 3:</b> Decide the budget preparation and control of a company. <b>CO 4:</b> Analyze the flow of funds. <b>CO 5:</b> Use Tally to implement the



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				needs of financial accounting
20MCAGE 04	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> <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</p>





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				<p>systems</p> <p>CO 5: Gain an understanding on the importance of security, privacy, and ethical issues as they relate to E-Commerce.</p>
20MCAGE 05	ETHICS IN COMPUTING	Global	<p>This course provides the basis for ethical decision-making and the methodology for reaching ethical decisions concerning computing matters</p>	<p><b>CO 1:</b> Predict the relationship between the law, ethics and computer technology.</p> <p><b>CO 2:</b> Outline the philosophical and ethical debates with the ideas and the nature of intellectual creativity.</p> <p><b>CO 3:</b> Design the impact of computer technology on free speech.</p> <p><b>CO 4:</b> Formulate the ethical and legal</p>



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				<p>issues of the impact that computing technologies had on workplace.</p> <p><b>CO 5:</b> Develop a personal standpoint in relation to DataBase society and the usage of biometric data.</p>
20MCAGE 06	RESOURCE MANAGEMENT TECHNIQUES	Global	<p>This course provides solution to problems in different environment that needs decision making using optimization techniques.</p>	<p><b>CO 1:</b> Identify the applications of Operations Research and methods to solve business problems.</p> <p><b>CO 2:</b> Apply linear programming to solve operational problem with constraints.</p> <p><b>CO 3:</b> Apply transportation and</p>



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				<p>assignment models to find optimal solution in warehousing and Travelling,</p> <p><b>CO 4:</b> Prepare project scheduling using PERT and CPM.</p> <p><b>CO 5:</b> Use optimization concepts in real world problems</p>
20MCAGE 07	ENTREPRENEURSH IP DEVELOPMENT	Global	<p>This course provides the skills necessary to succeed as an entrepreneur. It includes the fundamentals of starting and operating a business, developing</p>	<p><b>CO1:</b> Highlight the salient characteristics of successful entrepreneur</p> <p><b>CO2:</b> Enumerate the competencies relevant for Entrepreneurial development.</p> <p><b>CO3:</b> Delineate the growth of women Entrepreneurship in India.</p>



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			a business plan, obtaining financing, marketing a product or service and developing an effective accounting system	<p><b>CO4:</b> Identify the major problems faced in conducting EDPs.</p> <p><b>CO5:</b> Discuss the methods of project appraisal used for small scale enterprises</p>
20MCAGE 08	WIRELESS SENSOR NETWORKS	Global	This course provides knowledge on the architectures, functions and performances of wireless sensor systems and platforms. It also describes and analyze the specific requirements for	<p><b>CO 1:</b>Formulate the basic standardization of wireless networks.</p> <p><b>CO 2:</b>Analyze the implementation of technologies related to WSN.</p> <p><b>CO 3:</b>Identify and understand the security issues in ad hoc and sensor networks.</p> <p><b>CO 4:</b>Compare the protocols and to</p>



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			applications in wireless sensor networks regarding energy supply, memory, processing and transmission capacity	promote the research work in this area. <b>CO 5:</b> Apply and solve problems in the applications of Wireless Networking Area.
20MCAGE 09	RESEARCH METHODOLOGY	Global	This course provides an overview of various methods employed in quantitative and qualitative research.	<b>CO 1:</b> Predict the different stages of research process. <b>CO 2:</b> Apply methods to collect best data. <b>CO 3:</b> Assess the suitable research design & work. <b>CO 4:</b> Compare categorical and continuous measures. <b>CO 5:</b> Analyze the process of various



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				reports writing.
20MCAGE 10	DIGITAL IMAGE PROCESSING	Global	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><b>CO 1:</b>To review the fundamental concepts of a digital image processing system.</p> <p><b>CO 2:</b> To examine various types of images, their intensity transformations and spatial filtering.</p> <p><b>CO 3:</b>To analyze the different types of noises and the filters used to restore and reconstruct the images.</p> <p><b>CO 4:</b>To create color images and pseudo images with smoothening and sharpening</p>



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				techniques. <b>CO 5:</b> To compare the various lossy and lossless compression mechanisms.
20MCAGE 11	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 Service (SaaS), and Business Process as a Service	<b>CO 1:</b> Compare the strengths and limitations of cloud computing. <b>CO 2:</b> Identify the architecture, infrastructure and delivery models of cloud computing. <b>CO 3:</b> Apply suitable virtualization concept. <b>CO 4:</b> Choose the appropriate Cloud player, Programming Models and approach. <b>CO 5:</b> Address the core issues of cloud



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			(BPaaS).	computing such as security, privacy and interoperability
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