Zeal Education Society's

Zeal Institute of Business Administration, Computer Application & Research (ZIBACAR)

Sr. No. 39, Narhe, Pune -411041, Phone No.:67206031, Website: www.zibacar.in

(Approved by A.I.C.T.E., Recognized by DTE (Govt. of Maharashtra), Permanently Affiliated to Savitribai Phule Pune University an
NAAC)

PUN Code: IMMP013170   **DTE Code: 6152**   **AISHE Code: C-41828**

PO's & CO's of MCA Program 2019 Pattern

MCA Programme Outcomes (POs): At the end of the MCA programme the learner will possess the following Program Outcome:

PO1: Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.

PO2: Identify, formulate, research literature, and solve *complex* Computing problems reaching substantiated conclusions using fundamental principles of Mathematics, Computing sciences, and relevant domain disciplines.

PO3: Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.

PO4: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid conclusions.

PO5: Create, select, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.

PO6: Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practice.

PO7: Recognize the need, and have the ability, to engage in independent learning for continual development as a Computing professional.

PO8: Demonstrate knowledge and understanding of computing and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO9: Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.

PO10: Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practice.

PO11: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.

PO12: Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

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MCA Course Outcomes (COs): At the end of the every course the learner will possess the following Course Outcome:

Sr. No	Course Code	Course Name	Course Objective	Course Outcome
			SEMESTER -I	
1	IT-11	Problem Solving using C++	1. To learn the problem-solving techniques by solving small problems. 2. To learn features of the C++ programming language as a continuation of the previous course. 3. To enhance problem solving and programming skills in C++ with extensive programming projects.	CO1. Use the algorithm paradigms for problem solving. CO2. Develop programs with features of the C++ programming language. CO3. Develop simple applications using C++ CO4. Develop programs in the UNIX/Linux programming environment.
2	IT-12	Software Engineering using UML	1. To study basic concepts of software engineering 2. To study phases of SDLC and different process models 3. To learn & understand the Requirement analysis and system Design. 4. To get acquainted with the agile software development methodology	CO1: Distinguish different process model for a software development. CO2: Design software requirements specification solution for a given problem definitions of a software system. CO3: Apply software engineering analysis/design knowledge to suggest solutions for simulated problems CO4: Recognize and describe current trends in software engineering
3	IT-13	Database Management System	1. Identify structure of database system using data models and ER models 2. Demonstrate SQL , XML schema 3. Provide database design approaches with normalization	CO1: Describe the basic concepts of DBMS and various databases used in real applications. CO2: Design relational database using E-R model and normalization CO3: Demonstrate nonprocedural structural query languages for various database applications

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			4. Define and discuss transaction management and concurrency control	CO4: Apply concepts of Object Based Database, XML database and non-relational databases. CO5: Explain transaction management and recovery management for real applications
4	IT-14	Essential of Operating System	1. To learn the fundamentals of Operating Systems and handle processes and threads and their communication 2. To learn the mechanisms involved in memory management in contemporary OS 3. To know the functionality of Multiprocessor OS and Mobile OS. 4. To gain knowledge on distributed operating system concepts. 5. To learn about Basics of Linux. 6. To learn programmatically to implement Linux OS mechanisms	CO1: Understand structure of OS, process management and synchronization. (Understand) CO2: Understand multicore and multiprocessing OS. (Understand) CO3: explain Real-time and embedded OS (Understand) CO4: understand Windows and Linux OS fundamentals and administration. (Understand) CO5: solve shell scripting problems (Apply)
5	IT-15	Network Technologies	1. To understand various computer networks and technologies behind networks 2. To study TCP/IP protocol suite, IP addressing schemes and link layer communication 3. To study routing concept along with Routing protocols 4. To study application layer protocols 5. To understand basics of cryptography and socket programming	CO1: Understand structure of OS, process management and synchronization. CO2: Analyze and design Memory Management. CO3: Interpret the mechanisms adopted for file sharing in distributed Applications CO4: Conceptualize the components and can do Shell Programming. CO5: Know Basic Linux System Administration and Kernel Administration

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6	BM11	Business Process Domain	1. To learn & understand the processes and practices in business and their applications 2. To make students understand the necessity and importance of Marketing in business Environment. 3. To understand the concepts & role of e-commerce in business management 4. To introduce advance business applications like CRM and SCM. 5. To learn the financial aspects of business management.	CO1: describe major bases for marketing mix in business CO2: describe various functionalities of human resource process CO3: Identify existing e-commerce model and payment system, CO4: Apply knowledge to evaluate and manage an effective supply chain. CO5: Understand how customer relations are related to business functions and its importance to success of Business entity. CO6: use various banking and insurance process for business development.
7	IT11L	Practical based on IT11		
			SEMESTER-II	
8	IT-21	Data Structure and Algorithm	1. To impart the basic concepts of data structure and algorithms 2. To understand concepts about searching and sorting techniques 3. To understand basic concepts about stacks, queues, lists, trees and graphs 4. To understanding about writing algorithms and step by step approach in solving problems with the help of fundamental data structures	CO1: apply design principles and concepts for Data structure and algorithm CO2: summarize searching and sorting techniques CO3: describe stack, queue and linked list operation CO4: demonstrate the concepts of tree and graphs

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9	IT-22	Web Technology	1. To impart the design, development and implementation of Dynamic Web Pages. 2. To develop programs for Web using Scripting Languages. 3. To Design and implement dynamic websites with good sense of designing and latest technical aspects	CO1: Implement interactive web page(s) using HTML, CSS and JavaScript. CO2: Build Dynamic web site using server-side PHP Programming and Database connectivity. CO3: Design a responsive web site.
10	MT-21	BUSINESS STATISTICS	1. To understand the importance of data-driven business decisions. 2. To learn the basics of business decision-analysis. 3. To summarize business data numerically and graphically. 4. Learn the basics of beginning predictive business modelling 5. To understand the importance of business sampling methods, and be able to describe different business sampling methods. 6. To understand the process associated with statistical decisions, defining and formulating problems, analyzing the data, and using the results in decision making.	CO1: Demonstrate concepts of business statistics (such as measures of central tendency, dispersion, correlation, regression analysis and time series analysis) CO2: Students will be able to analyze and apply statistical tools to solve problems. CO3: based on the acquired knowledge to interpret the meaning of the calculated statistical indicators CO4: Demonstrate concept of index numbers for solving practical problems in business world
11	IT-23	Essentials of Networking	1. To understand various computer networks and technologies behind networks 2. To study TCP/IP suite. 3. To study routing concept along with Routing protocols 4. To be familiar with wireless networking concepts and protocols 5. To understand cryptography	CO1: Understand the basic concepts of data communication including the key aspects of networking and their interrelationship CO2: Understand various protocols such as HTTP, SMTP, POP3, IMAP, FTP, DNS, DHCP and the basic structure of IPv4, IPv6 Address and concept of sub netting with numerical

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				CO3: Understand routing concept and working of routing protocols such as RIP, OSPF and BGP CO4: Understand various encryption techniques
12	BM21	Principles and Practices of Management and Organizational Behaviour	1 To understand individual behavior in organizations, including diversity, attitudes, job satisfaction, emotions, moods, personality, values, perception, decision making, and motivational theories. 2 To understand group behavior in organizations, including communication, leadership, power and politics, conflict, and negotiations. 3 To understand the organizational system, including organizational structures, culture, human resources, and change.	**CO1.** Describe and analyze the interactions between multiple aspects of management. **CO2**. Analyze the role of planning and decision making in Organization **CO3**. Justify the role of leadership qualities, Motivation Group dynamics and Team Building. **CO4**. Compare the controlling process
13	IT21L	Practical based on IT21		
			SEMESTER-III	
14	IT-31	Java Programming	• To enable the students to understand the core principles of the Java Language and use AWT/Swing tools to produce well designed, effective applications. • • Students will be able to do socket programming, develop server side applications with database handling using Servlets, JSP, and JDBC	CO1: Understand Basic Concepts of Java and multi-threading.-Understand CO2: Demonstrate Collection framework -Apply CO3: Develop GUI using AWT and Swing -Apply CO4: Develop Java Applications using Socket, RMI – Apply CO5: Develop Web application using JSP and Servlet, JDBC with MVC --Apply

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15	IT-32	Data Warehouse and Data Mining	• To Study data warehouse architectures, OLAP and the project planning aspects in building a data warehouse • • To introduce the concepts, techniques, design and applications of data warehousing and data mining. • • To enable students to understand and implement classical algorithms in data mining • • To understand the various approaches to data warehousing and data mining implementations • • To understand how to analyze the data, identify the problems, and choose the relevant algorithms to apply	CO1: learn and understand techniques of pre-processing various kinds of data -Understand CO2: Understand Data warehouse concepts. - Understand CO3: Apply association Mining Techniques on large Data Sets. - Apply CO4: Apply classification and clustering Techniques on large Data Sets. - Analyze CO5: Understand other approaches of Data mining techniques. - Understand
16	IT-33	Software Testing and Quality Assurance	*To understand the principles of software development emphasizing processes and activities of quality assurance* *• To study fundamental concepts in software testing, including software testing objectives, process, strategies and methods.* *• To understand test design techniques based on functionality and structure of software* *• To understand test planning, monitoring and control process* *• To gain the techniques and skills on how to use software testing tools to support software testing activities*	*CO1: Understand the role of software quality assurance in contributing to the efficient delivery of software solutions –Understand* *CO2: Demonstrate specific software tests with well-defined objectives and targets –Apply* *CO3: Apply the software testing techniques in commercial environments –Apply* *CO4: Construct test strategies and plans for software testing –Analyze* *CO5: Understand the usage of software testing tools for test effectiveness, efficiency and coverage – Understand*
17	IT-34	Cloud Computing	*To introduce the fundamentals of cloud computing, its technologies, Challenges and Applications* *• To give Insights into the virtualization technologies and Architecture.*	CO1: Describe the concepts of Cloud Computing and its Service Models & Deployment Models – Understand. CO2: Classify the types of Virtualization – Understand.

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			• To know the relationship between Cloud and SOA. • To classify and evaluate Cloud Security Issues. • *To apply theory to practical knowledge through case Studies.*	CO3: Describe the Cloud Management and relate Cloud to SOA – Understand. CO4: Interpret Moving application s to of Cloud – Apply. CO5: Demonstrate practical implementation of Cloud computing – Apply.
18	MT31	Probability & Combinatory	• *Count similar things in sophisticated ways* • Understand the mathematical underpinnings of probability. • Use probability theory to solve interesting problems.	CO1: Apply counting principles to solve the problems – Apply CO2: Apply various mathematical tools to solve problems. –Apply CO3: Understand and apply basic probability principles. – Apply CO4: Demonstrate the concept of univariate and bivariate random variable – Apply CO5: Understand and illustrate the probability distributions.-Analyze
19	IT-31L	Practical based on Java Programming	• To enable students to develop a dynamic web application using knowledge of Servlet, JSP, JDBC using MVC.	CO1: Create Web application using JSP and Servlet, JDBC with MVC
			SEMESTER-IV	
20	IT-41	Python Programming	To understand and use the basic of python. • To understand advance concepts of python and able to apply it for solving the complex problems. • To understand the reading and writing data through file handling.	CO1: Understand concepts of python. -Understand CO2: Demonstrate the concepts modular programming - Apply CO3: Apply the concepts of concurrency control in python -Apply

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			• To understand basic database concepts in python. • To develop the critical thinking and analytical approach by using python libraries.	CO4: Solve the real life problems using object oriented concepts and python libraries –Apply CO5: Demonstrate the concept of IO, Exception Handling, database --Apply
21	BM-41	Information System and Security Audit	To understand and use the basic of python. • To understand advance concepts of python and able to apply it for solving the complex problems. • To understand the values of information, threats and vulnerabilities to IT system. • To study fundamental concepts of CIA of information and information security life cycle. • To study the information security polices and standards. • To understand the necessity of information security controls for IT system. • To gain the understanding of information security audit and IT governance frameworks for information security.	CO1: Interpret the threats and vulnerabilities from IT system of business software applications. - Apply CO2: Understand Information Security Management System (ISMS) for IT system of business -Understand CO3: Apply information security policies and standards for business IT System-Apply CO4: Discuss various IS controls for Business Continuity and Disaster Recovery of business IT system. -Understand CO5: Describe information security audit and understand information security IT governance framework. – Understand
22	MT-41	Optimization Techniques	• • To understand the role and principles of optimization techniques in business world. • • To understand the process of problem statement formulation of the business scenario. • • To understand the implementation of various decision making techniques in the process of decision making. • • To gain the techniques and skills on how to use optimization techniques to support the decision making in business world.	CO1: Understand the role and principles of optimization techniques in business world -Understand CO2: Demonstrate specific optimization technique for effective decision making -Apply CO3: Apply the optimization techniques in business environments -Apply CO4: -Illustrate and infer for the business scenario- Analyze CO5: analyze the optimization techniques in strategic planning for optimal gain. - Analyze

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23	IT-42	Essentials of Architectural Framework.	• To provide the students with a critical understanding of architecture framework concepts, properties and aspects. • To understand and differentiate Architecture Framework designs. • To understand and analyze real time based Architecture Framework	CO1: Understand Basics Fundamentals of Architecture and Framework. (Understand) CO2: Understand appropriate Architecture Framework design. (Understand) CO3: Select appropriate technical and industry specific frameworks. (Understand) CO4: Apply the software development process (Apply) CO5: Apply the quality of Architecture (Apply)
24	IT-43	Knowledge Representation and Artificial Intelligence	• To gain a historical perspective of AI and its foundations. • To become familiar with basic principles of AI toward problem solving and its methods such as Uninformed Search methods, Informed Search methods, local search algorithms and Adversarial Search. • To create an understanding of the basic issues of knowledge representation and Propositional Logic. • To brief about the different approaches of Planning and Learning in the field of Artificial Intelligence. • To explore the different application fields of Artificial intelligence and their real world examples.	CO1: Develop a basic understanding of AI building blocks presented in intelligent agents- Develop. CO2: Choose an appropriate problem solving method and knowledge representation technique – Choose. CO3: Apply the different Propositional Logic concepts for knowledge Representation-Apply. CO4: Analyze and understand the models for reasoning with uncertainty and different planning and learning approaches in the field of Artificial Intelligence – Analyze and understand. CO5: Demonstrate awareness and a fundamental understanding of various applications of AI – Demonstrate.
25	IT-41L	Practical based on Python Programming	• To understand and use the basic of python. • • To write, test, and debug simple Python programs.	CO1: Implement Python programs with conditionals and loops. (Apply) CO2: Develop Python programs step-wise by defining functions and calling them. (Apply)

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			• • To implement Python programs with conditionals and loops. • • Use functions for structuring Python programs. • • Represent compound data using Python lists, tuples, dictionaries. • • Read and write data from/to files in Python. • • Performing matrix operation using jumpy. • • Fetching, analysis and visualize data in different form • • To connect with database and perform insert, delete, update and view operations. • • To write programs using concurrent programming and handling exceptions	CO3: Apply Python lists, tuples, dictionaries for representing compound data. (Apply) CO4: Apply file handling function in Python. (Apply) CO5: Apply Numbly, pandas, matplot modules. (Apply)
			SEMESTER-V	
26	IT-51	Social Media & Digital Marketing	1. To understand the concept of Social Media and Digital Marketing 2. To learn various tools of Social Media and Digital Marketing 3. To acquaint with the techniques of SEO and SEM 4. To develop a mind-set to solve real world problems using digital marketing	CO1: Explain use of Social Media in Marketing (Understand) CO2: Demonstrate Digital Marketing Strategy (Apply) CO3: Summarize various tools of Social Media and Digital Marketing (Understand) CO4: Make use of SEO techniques for websites (Apply) CO5: Interpret SEM tools and techniques (Understand)
27	IT-52	Mobile Application Development	1. To understand the different mobile application Architectures.	CO1: Understand Various Mobile Application Architectures (Understand) CO2: Use different types of widgets and Layouts. (Apply)

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			2. To understand different types of widgets like buttons, views, layout etc. 3. To know the ways of application handling like intents, adapters, Notifications, Web Services and Web View. 4. To learn and know about data storing, retrieval and sharing in android. 5. To explore cross platform mobile application development framework, React Native and Flutter.	CO3: Describe Web Services and Web Views in mobile applications. (Understand) CO4: Implement data storing and retrieval methods in android. (Apply) C05: Demonstrate Hybrid Mobile App Framework. (Apply)
28	IT-53	Software Project Management	1. To learn process of Software Project Management. 2. To Study role of Project Manager in Project Management. 3. To learn Agile Project Management Framework. 4. To study various role of Agile Team and Tools. 5. To understand project planning and estimation.	CO1: Understand the process of Software Project Management Framework and Apply estimation techniques. (Understand) CO2: Learn the philosophy, principles and lifecycle of an Agile project. (Understand) CO3: Demonstrate Agile Teams and Tools. (Apply) CO4: Apply Agile project constraints and trade-offs for estimating project size and schedule (Apply) CO5: Explain Project Tracking and Interpretation of Progress Report. (Understand)
29	ITC51	Mini Project	1. To identify and understand a real-world problem 2. To understand the need of the project 3. To apply appropriate methodology relevant to the problem 4. To design and develop the solution for the problem 5. To enhance technical and communication skills and present the project work	CO1: Understand the real-world problem. (Understand) CO2: Express the need of the project through feasibility analysis and literature review. (Understand) CO3: Determine the project plan using appropriate methodology. (Apply) CO4: Implement the project design pertaining to the problem. (Apply) CO5: Demonstrate communication and team-work skills. (Apply)

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				CO6: Build and test the solution. (Create)
30	IT51L	Practical based on IT51 - Social Media and Digital Marketing	1. To understand digital and social media marketing 2. To learn various tools of Social Media and Digital Marketing 3. To acquaint with the techniques of SEO and SEM 4. To develop a mind-set to solve real world problems using digital marketing	CO1: Create Marketing Strategy using various tools of Social Media and Digital Marketing. (Create)