MCA Programme COs Syllabus 2019

Course Code	Course Name	CO	Course Outcome
IT 11	Problem Solving using C++	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
IT-12	Software Engineering Using UML	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
IT13	Database Management System	CO1	Describe the basic concepts of DBMS and various databases used in real applications.- Understand
		CO2	Design relational database using E-R model and normalization -Analyze
		CO3	Demonstrate nonprocedural structural query languages for various database applications-Understand
		CO4	Apply concepts of Object Based Database, XML database and non-relational databases. - Apply
		CO5	Explain transaction management and recovery management for real applications-Understand
IT-14	Essential of Operating System	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.
BM11	Business Process Domain	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
OS11	Open Subject 1 :RDBMS	CO1	Understand the basic concepts of Database Systems and Applications.
		CO2	Use the basics of SQL and construct queries using SQL in database creation.
		CO3	Understand a relational database system, Relational Algebra
		CO4	Study and Select storage and recovery techniques of database system.

OS12	Open Subject 2: C Programming With DS	CO1	Understand the various concepts of C programming
		CO2	Design and implement C Programs for given problem using array
		CO3	Design & programs that demonstrate effective use of C features including structure , pointers and files
		CO4	Describe , explain and use abstract data types including stack and queues
CS11	Case Study on Requirement Gathering	CO1	Understand the key aspects of information gathering using various tools & techniques
		CO2	Analyze the problem scenario, Comprehend information suitable for all stakeholders of project
IT11L	Practical Based on IT11	CO1	Implementing object-oriented principles using C++
		CO2	Analyzing problems and writing programming solutions to real world problems viz. Tower of Hanoi, Tic-Tac etc.
OS11	DBMS Lab	CO1	Apply the basic concepts of Database Systems and Applications.
		CO2	Use the basics of SQL and construct queries using SQL in database creation and interaction.
		CO3	Design a relational database system (Oracle, MySQL) by writing SQL using the system.
		CO4	Analyze and Select storage and recovery techniques of database system.
SS 11	SOFT SKILL-1	CO1	Label the different parts of a sentence, correctly spell and pronounce the words in common usage and effectively listen to short Audio Visual material
		CO2	Paraphrase published written and audio visual content in own words
		CO3	Applying skills by writing short paragraphs and essays for a specified task, to elicit, to select, to describe, to summarize information
		CO4	Analyzing and take part in conversations using general, social and professional language
IT21	Data Structure and Algorithm	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.
IT 22	Web Technology	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.
MT21	BUSINESS STATISTICS	CO1	Understand the concepts of business statistics (such as measures of central tendency, dispersion, correlation, regression analysis and time series analysis)
		CO2	To analyze and apply statistical tools to solve problems
		CO3	To interpret the meaning of the calculated statistical indicators based on the acquired knowledge
		CO4	Demonstrate concept of index numbers for solving practical problems in business world

IT23	Essentials of Networking	CO1	To understand various computer networks and technologies behind networks
		CO2	To study TCP/IP suite.
		CO3	To study routing concept along with Routing protocols
		CO4	To be familiar with wireless networking concepts and protocols
		CO5	To understand cryptography
BM21	Principles and Practices of Management and Organizational Behavior	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
OS21	Various Operating System	CO1	Students will be able to understand various operating system
		CO2	Students will be able to understand how to install operating system
		CO3	Students will be able to understand to practice programming executing on each operating system
OS22	Various Operating System Lab	CO1	Students will be able to install Windows operating system
		CO2	Students will be able to understand how to install android operating system
		CO3	Students will be able to understand to practice programming executing on each operating system
CS21	Case Study on Feasibility Study and Analysis	CO1	Apply the concept of domain and application analysis for solving Complex computing problems
		CO2	Exhibit the ability to apply the knowledge of Object Oriented Concepts for system analysis to check feasibility of system and analyzing cases
		CO3	Demonstrate the knowledge of object oriented Analysis & Design for document preparation and solving real time problems
IT21L	Data Structure and Algorithm	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.
OS22L	Web Technology Lab	CO1	Analyze a web page and identify its elements and attributes
		CO2	Programming web pages with JavaScript and PHP
		CO3	Design and Implement dynamic web site using Project management activities
SS 21	SOFT SKILL-II	CO1	To make the students aware of the importance, the role and the content of soft skills through instruction, knowledge acquisition, demonstration and practice
		CO2	To develop and nurture the soft skills of the students through individual and group activities
		CO3	Effectively communicate through verbal/oral communication and improve the listening skills & Write precise briefs or reports and technical documents.
		CO4	To encourage the all-round development of students by focusing on soft skills
IT31	Java Programming	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

IT-32	Data Warehousing and Data Mining	CO1	learn and understand techniques of preprocessing various kinds of data
		CO2	Understand Data warehouse concepts.
		CO3	Apply association Mining Techniques on large Data Sets.
		CO4	Apply classification and clustering Techniques on large Data Sets
		CO5	Understand other approaches of Data mining techniques.
IT-33	Testing & Quality Assurance	CO1	Understand the role of software quality assurance in contributing to the efficient delivery of software solutions
		CO2	Demonstrate specific software tests with well-defined objectives and targets
		CO3	Apply the software testing techniques in commercial environments
		CO4	Construct test strategies and plans for software testing
		CO5	Understand the usage of software testing tools for test effectiveness, efficiency and coverage
MT31	Probability & Combinatorics	CO1	Apply counting principles to solve the problems
		CO2	Apply various mathematical tools to solve problems
		CO3	Understand and apply basic probability principles
		CO4	Demonstrate the concept of univariate and bivariate random variable
		CO5	Understand and illustrate the probability distributions
IT34	Cloud Computing	CO1	Describe the concepts of Cloud Computing and its Service Models & Deployment Models
		CO2	Classify the types of Virtualization
		CO3	Describe the Cloud Management and relate Cloud to SOA
		CO4	Interpret Moving applications to of Cloud – Apply.
		CO5	Demonstrate practical implementation of Cloud computing – Apply.
OS-31	Open Subject - Testing Tool	CO1	Understand concepts of Testing Tools
		CO2	Analyze and Interpret the mechanisms adopted to write Test cases
		CO3	Demonstrate the concepts for writing test Script Using Testing tool
		CO4	Implement the various testing strategies and Develop Framework
		CO5	Execute projects successfully with the knowledge of software Testing tools
OS32	Open Subject: R Programming	CO1	Understand basic concepts, such as data type ,index and use them in their work
		CO2	Demonstrate use of basic & customized functions
		CO3	Conceptualize and create loops for different types of problems
		CO4	Construct tables & figures for descriptive statistics
		CO5	Learn to understand the new data sets
CS31	Case Study on Design	CO1	Understand the Concepts of Constructing DFD, ERD, Data Dictionary, FDD and UML Diagrams
		CO2	Demonstrate the ability to develop diagrams for the Cases
		CO3	Exhibit the knowledge in drawing the diagrams using Tools
SSC31	SOFT SKILL-III	CO1	Acquaintance with fundamentals of presentation and acquire the skills needed for communication
		CO2	Understand and exhibit effective presentation skills while using pause & effect for delivering speeches
		CO3	Apply the knowledge & use audio visual tools for making effective Presentation
		CO4	Demonstrate the etiquette like body language, Dressing ,gestures & Postures to make information more accessible to your audience
IT31L	Java Programming	CO1	Create Web application using JSP and Servlet, JDBC with MVC
		CO2	Practicing network based programs using java programming

Course Code	Course Name	CO	Course Outcome
OS32L	R Programming	CO1	Import, review, manipulate and summarize data-sets in R
		CO2	Demonstrate use of basic functions to solve various programs in R
		CO3	Apply Conceptualize and create loops, iterations and Boolean operators by writing R programs through examples

MCA Programme COs Syllabus 2020

Course Code	Course Name	CO	Course Outcome
IT11	Java Programming	CO1	Understand Basic Concepts of OOPs, Java, Inheritance, and Package. (Understand)
		CO2	Understand Exception handling, arrays and Strings and multi-threading in Java (Understand.)
		CO3	Understand collection framework (Understand)
		CO4	Develop GUI using Abstract Windows Toolkit (AWT) and event handling (Apply)
		CO5	Develop Web application using JSP and Servlet, JDBC (Apply)
IT12	Data Structure and algorithms	CO1	Demonstrate linear data structures linked list, stack and queue (apply)
		CO2	Implement tree, graph, hash table and heap data structures (apply)
		CO3	Apply brute force and backtracking techniques (apply)
		CO4	Demonstrate greedy and divide-conquer approaches (apply)
		CO5	Implement dynamic programming technique (apply)
IT13	Object Oriented Software engineering	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 (Analyze)
		CO4	Design user interface layout for different types of applications
		CO5	Recognize and describe current trends in software engineering
IT 14	Operating Systems Concepts	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)
IT15	Network Technologies	CO1	Understand the basic concepts of Computer Network, and principle of layering
		CO2	Apply the error detection and correction techniques used in data transmission
		CO3	Apply IP addressing schemes and sub netting
		CO4	Understand the concept of routing protocols, Application layer protocols and Network Security
		CO5	Apply the socket programming basics to create a simple chat application

OC11	Open Course- 1 (Linux System Administration)	CO1	Understand the architecture of a Linux system
		CO2	Students will be able to understand the basic commands of Linux operating system and can write shell scripts KNOWLEDGE
		CO3	Work at the Linux command line, including common GNU and UNIX commands
		CO4	Handle files and access permissions as well as system security
OC12	Open Course- 2 (WordPress)	CO1	Understand what a Content Management System is and how it differs from traditional, flat websites.
		CO2	Select the appropriate server environment and be able to install WordPress's files and database.
		CO3	Successfully organize and present content in WordPress.
IT11L	Practical's	CO1	Demonstrate Collection framework (Apply)
		CO2	Develop GUI using awt and swing (Apply)
		CO3	Develop Web application using JSP and Servlet, JDBC (Apply)
		CO4	Apply Data Structure to solve problems using JavaScript (Apply)
SS 11	SOFT SKILL-1	CO1	To demonstrate the ability to write error free while making an optimum use of correct Business Vocabulary & Grammar
		CO2	Paraphrase published written and audio visual content in own words
		CO3	Applying skills by writing short paragraphs and essays for a specified task, to elicit, to select, to describe, to summarize information
		CO4	Analyzing and take part in conversations using general, social and professional language
ITC11	Mini Project	CO1	Create working project using tools and techniques learnt in this semester (Create)
IT21	Python Programming	CO1	Understand Demonstrate the concepts of python and modular programming.
		CO2	Apply the concepts of concurrency control in python (Apply)
		CO3	Solve the real-life problems using object-oriented concepts and python libraries (Apply)
		CO4	Demonstrate the concept of IO, Exception Handling, database (Apply)
		CO5	Analyze the given dataset and apply the data analysis concepts and data visualization. (Analyze)
IT-22	Software Project Management	CO1	Understand the process of Software Project Management Framework and Apply estimation techniques. (Apply)
		CO2	Learn the philosophy, principles and lifecycle of an agile project. (Understand)
		CO3	Demonstrate Agile Teams and Tools and Apply agile project constraints and trade-offs for estimating project size and schedule (Apply)
		CO4	Explain Project Tracking and Interpretation of Progress Report (Understand)
		CO5	Analyze Problem statement and evaluate User Stories (Analyze)
MT21	Optimization Technique	CO1	Understand the role & principles of Optimization Technique in BusinessWorld
		CO2	Demonstrate Specific Optimization Technique for effective decision Making
		CO3	Apply the Optimization Technique in Business Environment
		CO4	Illustrate & infer for the business scenario
		CO5	Analyze the optimization technique in strategic planning for optimal gain

IT23	AIT	CO1	Outline the basic concepts of Advance Internet Technologies (Understand)
		CO2	Design appropriate user interfaces and implements webpage based on given problem Statement (Apply)
		CO3	Implement concepts and methods of NodeJS (Apply)
		CO4	Implement concepts and methods of Angular (Apply)
		CO5	Build Dynamic web pages using server-side PHP programming with Database Connectivity (Apply)
IT24	Advanced DBMS	CO1	Describe the core concepts of DBMS and various databases used in real applications
		CO2	Design relational database using E-R model and normalization (Apply)
		CO3	Demonstrate XML database and nonprocedural structural query languages for data access (Apply)
		CO4	Explain concepts of Parallel, Distributed and Object-Oriented Databases and their applications (Understand)
		CO5	Apply transaction management, recovery management, backup and security – privacy concepts for database applications (Apply)
OC21	Open Course-3	CO1	Have strong thinking capability
		CO2	Have problem solving attitude
		CO3	Be efficiently participating in Campus placement drives
		CO4	Be capable of Scoring high in competitive exams
		CO5	Be confident to take GATE, PSC, & other competitive examinations
OC22	Open Course-4	CO1	Understand the concept of Internet of Things
		CO2	Able to understand building blocks of Internet of Things and characteristics.
		CO3	Able to understand the application areas of IOT.
		CO4	Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks.
		CO5	Examine various SQL queries from MySQL database.
IT21L	Practical	CO1	Implement python programming concepts for solving real life problems. (Apply)
		CO2	Implement Advanced Internet Technologies (Apply)
ITC21	Mini Project	CO1	Create working project using tools and techniques learnt in this semester (Create)
SS 21	SOFT SKILL-II	CO1	To make the students aware of the importance, the role and the content of soft skills through instruction, knowledge acquisition, demonstration and practice
		CO2	To develop and nurture the soft skills of the students through individual and group activities
		CO3	Effectively communicate through verbal/oral communication and improve the listening skills & Write precise briefs or reports and technical documents.
		CO4	To encourage the all round development of students by focusing on soft skills
IT31	Mobile Application Development	CO1	Understand Various Mobile Application Architectures (Understand)
		CO2	Use different types of widgets and Layouts. (Apply)
		CO3	Describe Web Services and Web Views in mobile applications. (Understand)
		CO4	Implement data storing and retrieval methods in android. (Apply)
		CO5	Demonstrate Hybrid Mobile App Framework in android Architecture, Framework.

IT32	DWDM	CO1	Understand Data warehouse concepts, architecture and models (Understand)
		CO2	Learn and understand techniques of preprocessing on various kinds of data (Understand)
		CO3	Apply association Mining and Classification Techniques on Data Sets (Apply)
		CO4	Apply association Mining and Classification Techniques on Data Sets (Apply)
		CO5	Apply Clustering Techniques and Web Mining on Data Sets (Apply)
IT 33	Software Testing & Quality Assurance	CO1	Understand the role of software quality assurance in contributing to the efficient delivery of software solutions
		CO2	Demonstrate specific software tests with well-defined objectives and targets
		CO3	Apply the software testing techniques in commercial environments
		CO4	Construct test strategies and plans for software testing
		CO5	Understand the usage of software testing tools for test effectiveness, efficiency and coverage
IT34	Knowledge Representation and Artificial Intelligence: ML, DL	CO1	Understand basic building block of Artificial Intelligence and Knowledge Representation.(Understand)
		CO2	Apply Propositional Logic for knowledge representation. (Apply)
		CO3	Design various models based on Machine Learning methodology (Apply)
		CO4	Design various models based on Deep Learning methodology (Apply)
		CO5	Understand various hardware and software aspect used for AI and its Applications.(Understand)
IT35	Cloud Computing	CO1	Describe the concepts of Cloud Computing and its Service Models& Deployment Models
		CO2	Classify the types of Virtualization. (Understand)
		CO3	Describe the Cloud Management and relate Cloud to SOA. (Understand)
		CO4	Interpret Architecture and Pharrell Programming of Cloud Computing. (Apply)
		CO5	Demonstrate practical implementation of Cloud computing. (Apply)
OC31	Open Course-5 R Programming	CO1	To understand why Python is a useful scripting language.
		CO2	To learn how to use lists, tuples, and dictionaries in Python programs.
		CO3	To learn how to write loops and decision statements in Python.
		CO4	To learn how to write functions and pass arguments in Python.
		CO5	To learn how to design object-oriented programs with Python classes.
		CO6	To learn how to use exception handling in Python applications for error handling.
OC32	Open Course-6 Aptitude building-2	CO1	To develop basic skills related to aptitude.
		CO2	To aim towards a holistic growth keeping areas of soft skills in mind.
		CO3	To understand the use of aptitude in all the spheres of career and prepare for them precisely.
		CO4	To speak fluently and develop communication skills.
		CO5	The subject is offered in order to make the students industry ready/corporate ready and to help them understand the need to improve on the areas of aptitude
IT31L	Mobile Application Development Lab	CO1	Apply essential Android Programming concepts and develope small mobile android application by using android studio.
		CO2	Develop Android applications related to SQLITE database
IT31L	KRAI and ML ,DL Lab	CO1	Develop ML, DL models using Python (Apply)

SS31	SOFT SKILL-III	CO1	Acquaintance with fundamentals of presentation and acquire the skills needed for communication
		CO2	Understand and exhibit effective presentation skills while using pause & effect for delivering speeches
		CO3	Apply the knowledge & use audio visual tools for making effective Presentation
		CO4	Demonstrate the etiquette like body language, Dressing ,gestures & Postures to make information more accessible to your audience
ITC31	Mini Project	CO1	Create working project using tools and techniques learnt in this semester
IT41	DevOps	CO1	Describe the evolution of technology & timeline (Understand)
		CO2	Explain Introduction to various DevOps platforms (Remember)
		CO3	Demonstrate the building components / blocks of Devops and gain an insight of the Devops Architecture.(Understand)
		CO4	Apply the knowledge gain about Devops approach across various domains (Apply)
		CO5	Build DevOps application (Apply)
BM-41	PPM and OB	CO1	Describe and analyze the interactions between multiple aspects of management.(Understand)
		CO2	Analyze the role of planning and decision making in Organization (Analyze)
BM-41	PPM and OB	CO3	Justify the role of leadership qualities, Motivation and Team Building. (Analyze)
		CO4	Analyze stress management and conflict management (Analyze)
		CO5	Describe Personality and Individual Behavior (Understand)
ITC41	Project	CO1	Create working project using tools and techniques learnt in the programme (Create)