Course Outcome - Master of Computer Application (MCA)

Code	Course Name	Course Outcome
CA-101	Database Management System (DBMS)	• Apply the relational model, specify integrity constraints, and explain how to create a relational database using an ER diagram and normalization techniques. • Apply SQL to create, query and manipulate relational databases. • Determine partitioning and distribution of data across networked nodes of a DBMS and data optimization in a distributed environment.
CA-102	Operating Systems	• Analyze design aspects and data structures/policies/algorithms used for file subsystem, memory subsystem, process subsystem and i/o subsystem of Unix OS. • Differentiate between threads and processes and compare different processor scheduling algorithms • Identify the need to create the advance and special purpose operating system.
CA-103	Fundamentals of Artificial Intelligence	• Identify problems that are amenable to solution by AI methods. • Identify appropriate AI methods to solve a given problem. • Design smart system using different informed search / uninformed search or heuristic approaches.
CA-104 (A)	Computer Programming and Problem Solving	• Design blocks of the problems. • Build logic for solving new problems on paper. • Model the logic as code.
CA-104 (B)	Web Programming	• Design the web applications/sites • Apply dynamic paging using AngularJS/JSON/JQurey. • Use Javascript / Node.JS to make design and scripting.
: CA-105 (A)	Java Programming (Core Java)	• Create Java application development using polymorphism, inheritance, and inner classes. • Develop GUI interface and event driven applications. • Manipulate databases through java application.
CA-105 (B)	Object Oriented Programming using C++	• Understand and use the basic programming constructs of C++ and manipulate various C++ data types, such as arrays, strings, and pointers. • Manage memory appropriately using proper allocation / de-allocation procedures. • Write small-scale C++ programs using the above skills.
CA LAB - I	LAB on DBMS	• Design and implement a database schema for a given problem-domain • Create and maintain tables using PL/SQL, Populate and query a database using SQL DML/DDL commands and programming PL/SQL including stored procedures, stored functions, cursors, triggers. • Application development using PL/SQL & front-end tools.
CA LAB-II	LAB on OS (Linux)	• Implement the Installation of Linux system. • Understand the basic commands of Linux operating system and can write shell scripts. • Implement system administration tasks, installation, configuration and administration of internet servers.
CA	LAB on Computer	• Construct logic for the problems.

LAB-III (A)	Programming and Problem Solving(COPS)	• Write algorithms and able to draw logic on paper. • Write code for the logic developed.
CA LAB-III(B)	LAB on Web Designing	• Develop Web site/App. • Use Bootstrap/Javascript to make design and scripting. • Make Web site dynamic using AngularJS/JSON/JQurey.
CA LAB-IV(A)	LAB on Java Programming	• Write java program using inner classes and static fields in implementation of Java application • Develop Java application for GUI development and event handling. • Develop database application using JDBC.
CA LAB-IV	LAB on C++ Programming	• Develop logic of a program for solving real time problems and isolate and fix common 22 errors in C++ programs • Understand the object-oriented approach for the program development and make use of the OOP concepts (data abstraction, encapsulation, polymorphism, overloading, and inheritance) of C++ appropriately in problem solving. • Create applications using the STL library
CA-201	Advanced Software Development Methodologies	• Use git for software development and deployment. • Apply a thorough understanding of Agile principles and specific practices. • Judge, craft and evaluate appropriate adaptations to existing practices or processes depending 24 upon analysis of typical problems.
CA-202	Mathematical Foundations of Computer Science	• Identify, formulate, and develop solutions to computational challenges. • Analyze the behavior of the data, model the data using statistical measures and represent it graphically on paper without using available computerized tools. • Apply mathematical foundations, probability theory in the modeling and design of computational systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
CA-203	Data Structures and Algorithms	• Understand the concept of Dynamic memory management, data types, algorithms, Big O notation. • Understand data structures such as arrays, linked lists, stacks and queues, graphs, trees and hash tables. • Solve problem involving graphs, trees and apply different sorting and searching algorithms.
: CA-204 (A)	Machine Learning	• Acquire in-depth knowledge of various facets of Machine Learning methods/techniques and algorithms. • Envisage practical application of Machine Learning to Business and Research Computational problems. • Use knowledge of Machine Learning for product/service development.
CA-204 (B)	Digital Image Processing & Computer Vision	• Develop scientific and strategic approach to solve complex problems in the domain of Computer Graphics and Digital Image Processing; expose students to MATLAB Image Processing Toolbox. • Demonstrate various algorithms for scan conversion and filling of basic primitives objects and their comparative analysis and applied 2-D and 3-D geometric transformations, viewing and clipping on graphical objects. • Use the Mathematics for digital image representation, image

		acquisition, image transformation, image enhancement and restoration.
CA-205 (B)	Python Programming	• Use lists, tuples, dictionaries, strings and files efficiently for solving real world problems. Implement the concepts of object-oriented programming using python. • Develop modules, packages and GUI based programming for web.
CA LAB-V	LAB on Advanced Software Development Methodologies	• Use GitHub and make repository using Git. • Apply agile software development process. • Develop a project using agile methodology.
CA Lab-IV	LAB on Data Structures and Algorithms	• Develop solutions for a range of problems using procedure oriented / object-oriented programming. • Choose the appropriate data structure and algorithm design method for a specified application. • Apply practical knowledge on the applications of data structures.
CA LAB-VII (A)	LAB on Machine Learning	• Understand the implementation procedures for the machine learning algorithms. • Design Java/Python programs for various Learning algorithms. • Apply appropriate data sets to the Machine Learning algorithms. • Identify and apply Machine Learning algorithms to solve real world problems.
CA LAB-VII (B)	LAB On Digital Image Processing and Computer Vision	• Develop scientific and strategic approach to solve complex problems in the domain of Computer Graphics and Digital Image Processing; • Implement various algorithms for scan conversion, filling objects, 2-D and 3-D geometric transformations, viewing and clipping on graphical objects; • Make use of MATLAB and Image Processing Toolbox to implement image transformation, image enhancement in spatial and frequency domain.
: CA LAB-VIII (A)	LAB on Advanced Java (Technologies)	• Step-by-Step procedure for building the project from ground up by using IDE. • Create dynamic web application to utilize the JavaBeans and EJBs reusable components • Create web application using servlets, JSP, Strut and Hibernate technologies.
CA Lab-V	LAB on Python programming	• Demonstrate use and working of various data types, control structures, files, exceptional handling etc. • Create, configure and make use of modules. • Develop console based and GUI applications (both procedural/object oriented) to solve different problems using python programming.
CA-301	Compiler Construction	• Understand the basic structure of compiler, concepts and terminology in programming languages. • Explain lexical analysis, finite state techniques, scanner generator, parsing, kinds of parsers, designing lexical analyzer, scanner and parsers, principal ideas with intermediate code generation, optimizations.

		• Understanding of all concepts is essential to design compiler in general for programming languages.
CA-302	Design and Analysis of Algorithms	• To understand Basics of algorithms, design techniques and analyze the performance. • To learn Searching and traversal algorithms for graphs. • To understand Nondeterministic algorithms and NP class of problem.
: CA-303	High Performance Computing Paradigms and Applications	• Analyze the Cloud computing setup with its vulnerabilities and applications using different architectures. • Design suitable Virtualization concept, Cloud Resource Management. • Assess cloud Storage systems and Cloud security, the risks involved, its impact and develop cloud application.
CA-304 (A)	Natural Language Processing	• Understand issues and challenges in Natural Language Processing and NLP applications and their relevance in the classical and modern context. • Understand Computational techniques and approaches for solving NLP problems and develop modules for NLP tasks and tools. • Understand various grammar formalisms, which they can apply in different fields of study.
CA-304 (B)	Artificial Intelligence in Practice with Python	• Develop practical AI applications with solid understanding of many new AI techniques. • Implement more complex AI algorithms using Python. • Use AI algorithms to create new real world AI applications.
CA-304 (C)	Data Analytics	• Find a meaningful pattern in data; graphically interpret data. • Implement the analytic algorithms. • Handle large scale analytics projects from various domains; Develop intelligent decision support systems.
CA-305 (A)	Mobile Application Development (Android Programming)	• Compare android with other smartphone OS and desktop OS; Able to understand software stack of android OS. • Understand Activity lifecycle, UI management, use Intent, Broadcast receivers and Internet services. • Effectively use SQLite Database and content providers, multimedia, camera and Location based services in Android Application.
CA-305 (B)	Microsoft .Net Technologies	• Design Web applications / Website using ASP.NET. • Use ASP.NET controls in web applications • Debug and deploy ASP.NET web applications. • Create database driven ASP.NET web applications and web services.
CA-305 (C)	Ruby on Rails	• Understand Ruby Programming language with lexical and syntactic structure of Ruby programs, Datatypes and Objects, Expressions and Operators, Statements and Control Structures, Methods, procs, lambdas, and closures, Classes and modules, Reflection and Metaprogramming. • Use the Ruby TK (GUI for Ruby). • Design web applications using Rails framework

CA Lab-IX	LAB on Design and Analysis of Algorithms	• Construct logic for the algorithms designed using designing techniques. • Posterior analysis of the algorithms. • Debug, test and profile the algorithms, modify to improve performance of the algorithms.
CA LAB-X	Lab on High Performance Computing Paradigms and Applications	• Configure cloud infrastructure. • Monitor load on cloud, balance load by analyzing. • Work with real time cloud solutions.
CA LAB XI(A)	Lab on Natural Language Processing	• Idea about installation and use of NLTK in python. • Understanding of implementation of text files procesing operation and Regular Expressions in NLP • Knowledge of implementation of dependency parser, porter stemmer, Morphology, PoS Tagging and other NLP applications
CA LAB-XI (B)	LAB on AI Practice using Python	• Use most common artificial intelligence (AI) use cases in developing AI applications. • Apply various new artificial intelligence techniques in developing AI applications. • Create real-world AI application/s using above AI technique/s.
CA LAB-XI (C)	Lab on Data Analytics	• Develop code using R programming constructs. • Manipulate data using R. • 3) Write code for various data analysis techniques.
CA LAB-XII (A)	LAB on Android Programming	• Design and Implement User Interfaces and Layouts of Android App; Use Intents for activity and broadcasting data in Android App. • Design and Implement Database Application and Content Providers. • Develop Android App with Security features.
CA LAB-XII (B)	Lab on Microsoft .Net Technologies	• Design web site and web applications using ASP.NET • Debug and deploy ASP.NET web applications • Create database driven ASP.NET web applications and web services.
CA LAB-XII (C)	LAB on Ruby on Rails	• Develop program using syntactic structure in ruby. • Build program using APIs of Ruby Programming Language. • Design web applications using Rails framework.
CA-401	Full Time Industrial Training	• Handle specialized technology and update themselves with latest changes in technological world with ability to communicate effectively. • Be multi-skilled IT professional with good technical knowledge, management, leadership and entrepreneurship skills. • Be able to identify, formulate and model problems and find engineering solution based on a systems approach.