IMCA Program Course Outcomes (5 years)
A.Y.2021-22

CA 1.1 Mathematical Foundations in Computer Science

 Course Outcomes:

CO1:In this course, students should develop mathematical thinking and problem-solving skills associated with writing p

CO2: Students should also be exposed to a wide variety of mathematical concepts that are used in the Computer Scien
Theory.

CO3:Students should also be exposed to a wide variety of mathematical concepts that are used in the Computer Scienc
Matrices.

CO4:Students should also be exposed to a wide variety of mathematical concepts that are used in the Computer Scienc
Coordinate System.

CO5:Students should also be exposed to a wide variety of mathematical concepts that are used in the Computer Scienc
Permutation & Combination.

CO6:Students should also be exposed to a wide variety of mathematical concepts that are used in the Computer Scienc
Theory, Matrices, Coordinate System, Permutation & Combination

CA 1.2 Computer & Internet Fundamentals
Course Outcomes:

CO1: To understand basics of computer System

CO2: To understand Data Representation and Basic of Algorithm

CO3:To understand concept and functioning of Operating System

CO4:To acquire knowledge of Software & Computer Viruses.

CO5:To learn Fundamental of Internet & Advanced Application of Computer System in Real
Life.

CA 1.3 Computer Organization & Architecture
Course Outcomes:

CO1:Understand various digital logic gates, number systems, different methods used for the
simplification of Boolean functions

CO2:Design and analysis of a given digital Combinational circuit, Sequential hardware circuit, asynchro

CO3:Understand various functional units, Uniprocessor to multiprocessor, instructions, control and log
pipelining.

CO4: Understanding of Microprocessor 8086, block diagram, pin architecture, instruction set and simp
microprocessor.

CO5:Conceptualize elements of a memory hierarchy, I/O organization

CO6:Understand I/O interfaces and various modes of data transfer.

Subject: CA-1.4 Programming using C

Course Outcomes:

CO1: To explain the basic syntax and structure of Programming In C Language
CO2: To enrich the analyzing and problem solving skills and use the same for writing programs in Programming in C.
CO3: To develop a detailed understanding of function, array, string, control flow, pointer, structure and logical concepts of Programming In C.
CO4: Develop a program using arrays and pointers.
CO5: Understand the use of structure and union to solve complex problems.
CO6: Analyze problems in different applications and develop logic to implement their solution.

Subject: CA 1.5 Essentials of Web Designing

Course Outcomes:
CO1:To have basic knowledge of HTML
CO2:To have basic knowledge of Structuring documents for web page.
CO3: To have basic knowledge of HTML different formatting tags.
CO4:To have basic knowledge of HTML table tag.
CO5:Students should understand how to insert image in web page.
CO6:Students should understand how to insert audio and video in web page.

CA 2.1 Discrete Mathematics

Course Outcomes:

CO1: Ability to know the types of sets, method of representation, operations and laws related to it.
CO2: Ability to solve problems related to matrices and determinants.
CO3: Use mathematical concepts such as functions.
CO4: Ability to solve coordinates system and solve the concepts of permutation and combinations.
CO5: Understand the basic concepts of Statistics.
CO6: Analyze statistical data using measures of central tendency.

Subject: CA 2.2 System Programming

Course Outcomes:

CO1:Understand the introductory concepts of system software.

CO2: Understand the design and implementation of Assemblers with implementation examples.

CO3:Design and implement the linkers and loaders, macro processors and respective implementation examples.

CO4:Understands about basics of compilers.

CA 2.3 Object Oriented Analysis and Design

Course Outcomes:

CO1: Possess an ability to practically apply object oriented methods, such as object-oriented analysis and design methods with a clear emphasis.

CO2: Recall the principles of object-oriented.

CO3: Develop object-oriented software using different Modelling Techniques.

Subject: CA-2.4 Programming using C++

Course Outcomes:

CO1: To learn the fundamental programming concepts and methodologies which are essential to building good C++ programs.

CO2: To develop programs using the basic elements like C++ Controls, objects, classes, Pointers & functions in Programming in C++.

CO3: To develop detailed understanding of operator overloading, inheritance, virtual function, templates, exception, file handling and logical concepts of Programming in C++.

Subject: CA 2.5 Data Structure-I

Course Outcomes:

CO1:Students will be able to define and identify different types of Data Structures

CO2:Students will be able to understand the memory allocation of different data types and data Structures

CO3:Able to develop sorting and searching algorithms to sort list of numbers and strings

CO4:Able to develop applications using linked list and its operations such as insert, delete, traverse etc.

CO5:Able to develop applications using Linear Data Structures like Stack and Queue

CO6: Able to solve the complex problems by implementing appropriate data structure and required operations.

Subject: CA 3.1 Computer Networks

Course Outcomes:

CO1: To master the terminology and concepts of the OSI reference model and the TCP-IP reference model.

CO2:To master the concepts of protocols, network interfaces and design/ performance issues in LAN and WAN.

CO3:To be familiar with wireless networking concepts.

CO4:To be familiar with contemporary issues in networking technologies.

CO5:To be familiar with network tools and network programming.

Subject: CA 3.2 Operating System-I

Course Outcomes:

CO1: The core structure, functions and design principles of operating system will be introduced with this subject

CO2: To Study Basic Multithreading model, Deadlock concept & its related Scheduling algorithm in O.S

CA 3.3 System Analysis and Design

Course Outcomes:

CO1: To define the concept and knowledge of System, Analysis and Design

CO3:To learn System planning and Investigation

CO4: To learn Tools for structured system

CO5: CODING, TESTING, IMPLEMENTATION & MAINTENANCE

CO6: INTRODUCTION TO CASE TOOL

CA-3.4 Programming using C#.Net
Course Outcomes:
CO1: Students can understand the .NET framework & its use
CO2: To impart the knowledge of object oriented programming using C#, & develop console applications using basic concepts.

CO3: Be able to understand use of Objects and Types, Inheritance.

CO4: Understand and implement string manipulation, events and exception handling within .NET application environment.

CO5: Create and manipulate windows forms and other GUI components in C#.

CO6: Design and Implement database connectivity using ADO.NET in window based application.

Subject: CA 3.5 Data Structure-II

Course Outcomes:

CO1:Students will be able to define, identify the memory requirement of different types of Data Structures
CO2:Students will be able to calculate the space and time complexity of different algorithms.
CO3:Able to develop advance sorting methods to sort the list of different data items**.**
CO4:Able to write the applications using Tree and Graph Data Structure with operations such as insert, delete, traverse etc.
CO5:Able to develop applications using Hashing Techniques and Files Structures
CO6: Able to solve the complex problems by implementing appropriate algorithms, Data structures and File Structures.

Subject: CA 4.1 Basics of Accounting

Course Outcomes:

CO1-Student will learn the basics of Accounting.
CO2-Student will learn to understand the fundamental concept of financial accounting.
CO3-Student will learn to understand the Accounting terms and types of accounts.
CO4-Student will learn to Rectification of errors. trial balance and suspense accounts.
CO5-Student will learn the Final Accounts
CO6-Student will learn the Bank Reconciliation Statement.

CA 4.2 Operating System-II

Course Outcomes:

CO1: Student will be able to understand core functions, segmentation, Memory Management Unit, Loading, Monitor Concept of OS.
CO2: Students will able to solve Classical Synchronization Problems.
CO3: They will able to solve Disk & Memory Scheduling algorithms.
CO4: Students will able to implement & Solve Page Replacement Algorithms.
CO5: Student will understand File System Structure & Hierarchy of File System Structure.

CA 4.3 Network Security

Course Outcomes:

CO1: To introduce the student with security attacks, security threats and hash algorithms.
CO2: To study and understand the cryptography and authentication.

CA 4.4 Java Programming

Course Outcomes:

After completion of this course students shall be able to-
CO1: Understand object oriented programming in Java and also understand String, String Buffer and wrapper classes.
CO2: Understand advanced object oriented concepts like inheritance, polymorphism, abstract class, interface and packages.
CO3:Understand multithreading in Java programs, file handling and exception handling methods.
CO4: Understand the basics of GUI (Graphical User Interface) programming and event handling.

CA 4.5 Database Management System
Course Outcomes:
  CO1: Demonstrate the fundamentals of data models and conceptualize and depict a database system and Make use of ER diagram in developing ER Model

  CO2: Summarize the SQL and relational database design.

  CO3:Illustrate transaction processing, concurrency control techniques and recovery

  CO4: Inference the database design in the real world entities.

CA 5.1 Theoretical Computer Science

Course Outcomes:

On completion of this course students will be able to

CO1: Understand basic properties of deterministic and nondeterministic finite automata.
CO2: Understand basic properties of formal languages and formal grammars.
CO3: Understand the relation between types of languages and types of finite automata.
CO4: An understanding of Context frees Languages.

CO5: An understanding of Push down Automata.
CO5: Use Adern's theorem in problem.

CA 5.2 Software Engineering-I

Course Outcomes:

CO1: Basic knowledge and understanding of the analysis and design of complex systems.
CO2:Ability to apply software engineering principles and techniques.
CO3:Ability to develop, maintain and evaluate large-scale software systems.
CO4:To produce efficient, reliable, robust and cost-effective software solutions.

CA 5.3 Computer Graphics

CO1: Understand the basics of computer graphics, different graphics systems and applications of computer graphics.

CO2: Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis.

CO3: Use of geometric transformations on graphics objects and their application in composite form.
CO4: Extract scene with different clipping methods and its transformation to graphics display device.
CO5: Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.
CO6: Render projected objects to naturalize the scene in 2D view and use of illumination models for this.

CA 5.4 Advanced Java

Course Outcomes:
CO1:Student should acquire knowledge of developing a full fledge application using appropriate GUI and event handling.
CO2:Students should be able to develop web based applications, desktop applications with an appropriate understanding of using databases at backend.

CA 5.5 UI Design Technologies – II

Course Outcomes:

CO1 - Perform coding of Functions and Event Handling in JavaScript.
CO2 - Declaring Object, using different types of object of in JavaScript.
CO3 - Declaring Array and Strings, Using different methods on it.
CO4 - Accessing Forms and Frames, using different properties and apply validations in forms.
CO5 - Understanding XML, use of XML and Declaration of XML with processing.

CA-6.1 Automata Theory and Computability

Course Outcomes:

CO1: A general understanding Finite Automata.
CO2: An understanding of Regular Expressions.
CO3: A general understanding of Grammars and Languages
CO4: An understanding of CFL
CO5: An understanding of Push down Automata.
CO6: An understanding of Turing Machine.
CO7: An understanding of Complexity Theory

CA 6.2 Software Engineering II

Course Outcomes:

CO1: Student will be aware of advance software engineering methods.
CO2: Student will be familiar with the modern software development tools like Agile.
CO3: Student will be able to gather and the software requirements of different domains.
CO4: Student will be able to apply different software designing models.
CO5: Students will be able to understand to use integrated CASE tools.

CA 6.3: Advanced Data Base Management System

Course Outcomes:
CO1: To understand basic concepts of DBMS.
CO2: To understand database security concepts.
CO3: To design entity relationship and convert entity relationship diagrams into RDBMS and formulate SQL queries on the respect data into RDBMS and formulate SQL queries on the data.

CO4:To understand database recovery concepts and indexing

CO5:To manage different databases

CO6:To understand new emerging database technologies

CA 6.4 Linux Operating System

Course Outcomes:

CO1: Students will be able to understand the basic set of commands of Linux operating system.
CO2: Learn and Apply and change the ownership and file permissions using advance Linux commands.
CO3: Learn to Implement shell scripts and Vi editor commands.
CO4: Learn to Implement C programming in Linux editor.
CO5: Student should learn to perform system administration task such as installation , enable/disable system startup services, shutdown a system etc.

CA 6.5 UI Design Technologies – II

Course Outcomes:

CO1 - Create HTML document to demonstrate various selectors in JQuery.
CO2 - Implement Event handling in jQuery.
CO3 - Develop web pages using AJAX.
CO4 - Create HTML document using scripting to demonstrate effects in JQuery.
CO5 - Create a HTML document to demonstrate plugin-using jQuery.

CA-7.1 Cloud Computing
CO1. Students will learn fundamental concepts of cloud computing.
CO2. Students will be able to understand core components & corresponding business operation of CDC.
CO3. Students will learn virtualization of core technologies to form a virtulized data centre.
CO4. Students will learn essential infrastructure component required in cloud computing.
CO5. Student will learn different security concern & migration in cloud environment.

CA-7.2 Artificial Intelligence
CO1. Understand the heuristic search techniques for AI related Problems.
CO2. Represent Knowledge in suitable forms for computer processing.
CO3. Apply the natural language processing techniques to computer.
CO4. Apply the learning techniques to Computer.

CA-7.3 Data Warehousing & Mining
CO1. Course Outcomes: To impart the knowledge to the students so that they will be able to Basic concept of data warehousing and its architecture.
CO2. Develop a business model by analyzing different business problems using OLAP tools. Develop and solve different problems by using data mining techniques.
CO3. Analyze data and extract association rules to develop algorithms for classification and prediction models.
CO4. Develop data mining applications using clustering methods.
CO5. Develop complex applications by applying various data warehousing and mining techniques.

CA-7.4 Web Scripting with PHP & MySQL
CO1. Students shall be able to install PHP Software & executing simple PHP programs in that environment.
CO2. Students shall be able to use basic structure & concepts for receiving & submitting data in web pages
CO3. Students shall be learn array for storing & processing data of different types.
CO4. Students shall be able to learn to used different built in & user defined functions.
CO5. Students shall be able to learn to manage databases using MySQLdb.
CO6. Students shall be able to develop application with advance PHP(web based concepts such as email & CMS).

CA-7.5 Design and Analysis of Algorithm
CO7. To able Analyse the asymptotic performance of algorithms and sorting techniques.

CO8. To able elementary data structure & divide and conquer techniques programs are implements and design.
CO9. To able design and implement all greedy algorithm techniques
CO10.   To able design and implement dynamic programming and all shortest path.
CO11.   To able design and implement all basic searching techniques and backtracking.
CO12. To able design and implement np-completeness of deterministic and non-deterministic algorithms.

CA-8.1 Machine Learning
CO1. Students will understand the basic Machine Learning concepts and techniques.
CO2. Students will be able to write simple applications using Supervised Machine Learning techniques.
CO3. Able to prepare, read and use different datasets.
CO4. Able to write the applications using clustering algorithms.
CO5. Able to evaluate and analyze machine learning models for given problems
CO6. CO6: Able to solve given research problem using effective machine learning techniques.

CA-8.2 Digital Image Processing
CO1. Have an appreciation of the fundamentals of Digital Image Processing including then topics of filtering, transforms and morphology, and image analysis and compression.
CO2. Analysis of digital image processing system and generation of image and Digital Image Fundamentals and image model to understand sampling and quantization.
CO3. Solve the Transforms and separable image transforms (Walsh, hadamard, discrete cosine, slant, KL).
CO4. Enhancement and Filtering partial filtering-smoothing, sharpening and also understand Restoration of image, generalized inverse and speckle images.
CO5. Segmentation, Detection of discontinuities to understand, thresholding and segmentation.

CA-8.3 Optimization Algorithms
CO1. Recall the theoretical foundations of various issues related to linear programming modeling to formulate real-world problems as a L P model.
CO2. Explain the theoretical workings of the graphical, simplex and analytical methods for making effective decision on variables so as to optimize the objective function.
CO3. Identify appropriate optimization method to solve complex problems involved in various industries.
CO4. Demonstrate the optimized material distribution schedule using transportation model to minimize total distribution cost.
CO5. Find the appropriate algorithm for allocation of resources to optimize the process of assignment.
CO6. Apply the knowledge of game theory concepts to articulate real-world competitive situations to identify strategic decisions to counter the consequences.

CA-8.4 Network Programming
CO1. Get the concepts of Data Communication and Networking, Reference models.
CO2. Get the concepts of error detection & correction methods.
CO3. Get the concepts of Internetworking & devices, Routing techniques.
CO4. Get the concepts of protocols like DNS, SMTP, SNMP, FTP, HTTP etc.
CO5. Get the concepts of Security

CA-8.5 Internet Programming with ASP.NET
CO1. Understand the Microsoft .NET Framework and ASP.NET page structure.

CO2. Create a Web form with server controls.
CO3. Separate page code from content by using code-behind pages, page controls, and components.
CO4. Display dynamic data from a data source by using Microsoft ADO.NET and data binding.

CA-9.1 Natural Language Processing
CO1. Ability to know the basic concepts of NLP.
CO2. Ability to apply Mathematical Foundation in NLP problems
CO3. Ability to develop manual and machine learned methods for Parts of Speech tagging
CO4. Ability to design and develop FSM for Words & Morphology parsing algorithms / methods
CO5. Ability to understand the concept of N-Gram Models and apply it in NLP problems
CO6. Ability to write and present research paper on different research and publication domains of NLP

CA-9.2 Compiler Construction
CO1. Understand the basic structure of compiler, concepts and terminology in programming languages.
CO2. Explain lexical analysis, finite state techniques, scanner generator, parsing, and kinds of parsers, designing lexical analyzer, scanner and parsers, principal ideas with intermediate code generation, optimizations.
CO3. Understanding of all concepts is essential to design compiler in general for programming languages.

CA-9.3 Drupal CMS
CO1. course covers technologies required to build classic website environments.
CO2. Get the knowledge of Website Development, Drupal Framework
CO3. Additional areas of focus include security, Content, Structure, Block, Site Folders, Session etc.

CA-9.4 Mobile Computing Trends
CO1. Install and use the IDE to develop and run basic mobile application programs (Hello World).
CO2. Create simple android applications by using different layouts and UI design menus.
CO3. Develop mobile applications by experimenting on different intent, broadcast receiver and internet services.
CO4. Develop mobile applications with different background services.
CO5. Develop mobile applications by using data files.
CO6. Analyze data and develop relevant databases, write applications using SQLite.

CA-9.5 Programming in Python
CO1. Interpret the fundamental Python syntax and semantics.
CO2. To be fluent in the use of Python control flow statements and Express proficiency in the handling of strings and functions.
CO3. Determine the methods to create and manipulate Python programs by utilizing the data structures like lists, dictionaries, tuples and sets.
CO4. Identify the commonly used operations involving file systems and regular expressions.
CO5. Articulate the Object-Oriented Programming concepts such as encapsulation, inheritance and polymorphism as used in Python.
CO6. Understand the Object-Oriented concepts such as python modules, packages and Database connectivity.

CA-10.0 Full Time Industrial Training

CO1. Handle specialized technology and update themselves with latest changes in technological world with ability to communicate effectively.
CO2. Be multi-skilled IT professional with good technical knowledge, management, leadership and entrepreneurship skills.
CO3. Be able to identify, formulate and model problems and find engineering solution based on a systems approach.