

## TEACHING PLAN [B.Sc. 1st Sem (Major)]

(July, 2025 to November, 2025)

**Name of the Teacher: Dr. Vikas Chahar (Practical)**

**Mr. Deepak Garg (Theory)**

**Subject: Computing Fundamentals and C Programming**

**Paper: 24CSCM401DS01**

| Week   | Topics                                                                                                                       |
|--------|------------------------------------------------------------------------------------------------------------------------------|
| Week 1 | Introduction to Computing Fundamentals – Overview, Principles, and History; Generations of Computers.                        |
| Week 2 | Major Components of Computer, Classification of Computers, Applications in Various Fields.                                   |
| Week 3 | Input/Output Devices and Memory Concepts – Primary, Secondary, and Cache Memory.                                             |
| Week 4 | Secondary Storage Devices; Introduction to Networking – Definition, Need, and Basic Terms.                                   |
| Week 5 | Types of Networks (LAN, MAN, WAN), Network Topologies; Internet and its Applications.                                        |
| Week 6 | Operating Systems – Definition, Functions, and Types.<br><b>Test 1 on Unit I topics.</b>                                     |
| Week 7 | Introduction to Software Development Methodologies, Algorithmic Thinking, and Problem-Solving Strategies.                    |
| Week 8 | Planning the Computer Program – Problem Definition, Program Design, Debugging, Types of Errors.                              |
| Week 9 | Flowcharting and Algorithms – Techniques of Problem Solving.<br><br><b>Assignment 1: Algorithm &amp; Flowchart Problems.</b> |

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| Week 10 | Introduction to C Language – History, Importance, Structure of a C Program, Basic I/O Functions.                                                              |
| Week 11 | Operators & Expressions – Type Casting, Operator Hierarchy, and Associativity.<br><br><b>Test 2 on Unit II topics.</b>                                        |
| Week 12 | Decision Making – IF, IF-ELSE, Nested IF, ELSE-IF Ladder, Switch, Goto Statements.                                                                            |
| Week 13 | Looping Structures – While, Do-While, For Loop, Break, Continue, Nested Loops.<br><br><b>Assignment 2: Looping Exercises.</b>                                 |
| Week 14 | Functions – Definition, Prototype, Parameters, Recursion, Local and Global Variables.                                                                         |
| Week 15 | Arrays & Strings – Definition, Initialization, Processing, Passing Arrays to Functions, String I/O and Manipulation.                                          |
| Week 16 | Pointers, File I/O, Dynamic Memory Allocation, Debugging Techniques, and Coding Standards.<br><br><b>Test covering Units III &amp; IV.</b>                    |
| Week 17 | Revision of Unit I & II topics.                                                                                                                               |
| Week 18 | Revision of Unit III & IV topics; Focused practice on functions, arrays, pointers, and file handling.<br><br><b>Comprehensive Revision &amp; Q/A Session.</b> |

## TEACHING PLAN [B.Sc. 1st Sem (Minor)]

(July, 2025 to November, 2025)

**Name of the Teacher: Dr. Vikas Chahar (Practical)**

**Mr. Deepak Garg (Theory)**

**Subject: Fundamentals of Computing and Problem-Solving Using C**

**Paper: 24CSC401MI01**

| Week   | Topics                                                                                                                                                                                                                                                                                    |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Week 1 | Computing Fundamentals: Overview of Computing Principles and History, Generations of Computers, Block Diagram along with its Components.                                                                                                                                                  |
| Week 2 | Classification of Computers, Applications of Computers in various fields, Input/Output Devices.                                                                                                                                                                                           |
| Week 3 | Memory: Concept of Primary & Secondary Memory, Cache Memory, Secondary Storage Devices.                                                                                                                                                                                                   |
| Week 4 | Basics of Networking & Operating System: Introduction to Computer Networking, Network Types, Network Topologies, Internet and its Applications; Operating System and its Functions.<br><br><b>Test 1 on Unit I topics.</b>                                                                |
| Week 5 | Introduction to Software Development Methodologies: Basics of Algorithmic Thinking and Problem-Solving Strategies.                                                                                                                                                                        |
| Week 6 | Planning the Computer Program: Problem Definition, Program Design, Debugging, Types of Errors in Programming, Techniques of Problem Solving – Flowcharting, Algorithms.                                                                                                                   |
| Week 7 | Introduction to the C Programming Language: History and Importance of C, Elements of C – Character Set, Identifiers, Keywords, Data Types, Constants and Variables.                                                                                                                       |
| Week 8 | Assignment Statement, Symbolic Constants, Structure of a C Program, printf(), scanf() Functions, Operators and Expressions, Type Casting and Conversion, Operator Hierarchy and Associativity.<br><br><b>Assignment 1: Write C programs using operators, data types, and expressions.</b> |
| Week 9 | Decision Making & Branching: IF, IF-ELSE, Nested IF, ELSE-IF Ladder, Switch, and Goto Statements.                                                                                                                                                                                         |

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| Week 10 | <p>Looping: while, do-while, and for Loops; Jumps in Loops, break, continue, Nested Loops.</p> <p><b>Test 2 on Unit II topics.</b></p>                                                            |
| Week 11 | Functions and Modular Programming Concepts: Standard Mathematical Functions, Input/Output: Unformatted & Formatted I/O Functions in C.                                                            |
| Week 12 | String Manipulation Functions, User Defined Functions: Definition, Function Prototype, Local and Global Variables.                                                                                |
| Week 13 | <p>Passing Parameters, Recursion in C.</p> <p><b>Assignment 2: Write modular programs using user-defined functions and recursion.</b></p>                                                         |
| Week 14 | Arrays & Pointers: Definition, Types, Initialization, Processing an Array, Passing Arrays to Functions.                                                                                           |
| Week 15 | Declaration and Initialization of Strings, Input/Output of String Data, Introduction to Pointers, Memory Management in C.                                                                         |
| Week 16 | <p>File Input/Output Operations, Dynamic Memory Allocation and Deallocation, Practical Applications of C Programming in Software Development.</p> <p><b>Test covering Units III &amp; IV.</b></p> |
| Week 17 | Revision of Unit I & II topics; Practice on Flowcharts, Algorithms, and Basic C Programs.                                                                                                         |
| Week 18 | <p>Revision of Unit III &amp; IV topics; Practice on Arrays, Pointers, and File Handling.</p> <p><b>Comprehensive Revision &amp; Q/A Session.</b></p>                                             |

## TEACHING PLAN [B.Sc. 1st Sem (SEC)]

(July, 2025 to November, 2025)

**Name of the Teacher: Dr. Vikas Chahar (Practical)**

**Mr. Deepak Garg (Theory)**

**Subject: Web Development – I**

**Paper: 24CSC401SE01**

| Week    | Topics                                                                                                                                                                                                       |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Week 1  | Introduction to Internet: Overview of Internet, World Wide Web, Evolution and History of WWW; Basic Features; Evolution of Web Development.                                                                  |
| Week 2  | Web Browsers; Web Servers; Hypertext Transfer Protocol (HTTP); URLs; IP Addresses; Domain Names.                                                                                                             |
| Week 3  | Searching and Web-Casting Techniques; Search Engines and Search Tools; Internet Security; The Web Programmer's Toolbox.                                                                                      |
| Week 4  | Web Technologies: Introduction to Web Technologies; Introduction to HTML, CSS, and JavaScript; Client-Side vs. Server-Side Scripting.<br><br><b>Test 1 on Unit I topics.</b>                                 |
| Week 5  | Web Publishing: Hosting your Site; Internet Service Provider; Planning and Designing Website.                                                                                                                |
| Week 6  | Steps for Developing your Site; Choosing the Contents; Home Page; Domain Names.                                                                                                                              |
| Week 7  | Creating a Website and Markup Languages (HTML, DHTML); HTML Document Features; HTML Command Tags.                                                                                                            |
| Week 8  | Creating Links; Headers; Text Styles and Structuring; Text Colors and Background; Formatting Text; Page Layouts; Lists and Tables.<br><br><b>Assignment 1: Create a multipage static website using HTML.</b> |
| Week 9  | Meta Element; HTML5 Form Input Types; Input and Datalist Elements; Autocomplete Attribute; Page-Structure Elements.                                                                                          |
| Week 10 | Introduction to DHTML and its Features; Brief Introduction to Interactivity Tools: CGI; Features of Java; JavaScript Overview.<br><br><b>Test 2 on Unit II topics.</b>                                       |
| Week 11 | JavaScript Execution Environment; The Document Object Model (DOM); Element Access in JavaScript.                                                                                                             |

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| Week 12 | Events and Event Handling; Handling Events from Body, Button, Textbox, and Password Elements; The DOM 2 Event Model.                                                              |
| Week 13 | Navigator Object; DOM Tree Traversal and Modification.<br><br><b>Assignment 2: Develop an interactive web page using DOM and JavaScript events.</b>                               |
| Week 14 | Introduction to CSS: Block and Inline Elements; Inline Styles; Internal and External CSS; How CSS Rules Cascade and Inherit.                                                      |
| Week 15 | CSS3 Basics: Selectors; Color Properties (Foreground, Background, Contrast, Opacity); Text and Font Properties.                                                                   |
| Week 16 | List, Table, and Form Styling; Layout and Positioning Concepts; Relative, Absolute, Fixed Positioning; z-index, Float, and Clear.<br><br><b>Test covering Units III &amp; IV.</b> |
| Week 17 | Revision of Unit I & II topics.                                                                                                                                                   |
| Week 18 | Revision of Unit III & IV topics.<br><br><b>Comprehensive Revision &amp; Q/A Session.</b>                                                                                         |

## TEACHING PLAN [B.Sc. 3rd Sem (Major)]

(July, 2025 to November, 2025)

**Name of the Teacher: Dr. Vikas Chahar (Practical)**

**Mr. Deepak Garg (Theory)**

**Subject: Data Structures and Algorithms**

**Paper: 25CSCM403DS01**

| Week    | Topics                                                                                                                          |
|---------|---------------------------------------------------------------------------------------------------------------------------------|
| Week 1  | Introduction to Data Structures: Classification of Data Structures, Application of Data Structures.                             |
| Week 2  | Algorithms: Role of algorithms in computing, Complexity of algorithms, Analysing and Designing Algorithms, Asymptotic Notation. |
| Week 3  | Arrays: One Dimensional, Two Dimensional and Multi-Dimensional Arrays, Sparse Matrices.                                         |
| Week 4  | Searching & Sorting: Linear and Binary Search, Selection, Insertion and Bubble Sort.                                            |
| Week 5  | Advanced Sorting: Merge Sort, Quick Sort, and Radix Algorithms.<br><b>Test 1 on Unit I topics.</b>                              |
| Week 6  | Stacks: Definition, Implementation, and Operations; Evaluation and Conversion of Infix, Prefix, and Postfix Expressions.        |
| Week 7  | Queues: Definition, Sequential and Circular Queue Implementation, Dequeue and Priority Queues.                                  |
| Week 8  | Application of Stacks and Queues.<br><b>Assignment 1: Stack and Queue Implementation Programs.</b>                              |
| Week 9  | Linked Lists: Need of Dynamic Data Structures, Singly Linked List, Operations on List, Linked Stack and Queue.                  |
| Week 10 | Polynomial Representation using Linked Lists; Traversing, Insertion, and Deletion Operations.                                   |
| Week 11 | Circular and Doubly Linked Lists – Implementation and Primitive Operations.<br><b>Test 2 on Unit II topics.</b>                 |
| Week 12 | Trees: Definition, Terminology, Binary Tree, Static and Dynamic Implementation, Primitive Operations.                           |

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| Week 13 | Binary Tree Traversal – Preorder, Inorder, Postorder; Expression Trees.<br><b>Assignment 2: Tree Traversal Implementation.</b>     |
| Week 14 | Binary Search Trees: AVL Trees, Threaded Trees, B++ Trees, and Balanced Multiway Search Trees.                                     |
| Week 15 | Graphs: Definition, Terminology, Representation, Minimum Spanning Trees, Warshall's Algorithm.                                     |
| Week 16 | Graph Traversal – BFS, DFS; Heap Sort Algorithm Implementation.<br><b>Test covering Units III &amp; IV.</b>                        |
| Week 17 | Revision of Unit I & II topics; Practice of Algorithms and Array-based problems.                                                   |
| Week 18 | Revision of Unit III & IV topics; Practice on Linked Lists, Trees, and Graphs.<br><b>Comprehensive Revision &amp; Q/A Session.</b> |



## TEACHING PLAN [B.Sc. 3rd Sem (Minor)]

(July, 2025 to November, 2025)

**Name of the Teacher: Dr. Vikas Chahar (Practical)**

**Mr. Deepak Garg (Theory)**

**Subject: Object-Oriented Concepts and C++ Programming**

**Paper: 25CSC403M101**

| Week    | Topics                                                                                                                                                                          |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Week 1  | Concept of OOP: Comparison of Procedural Programming and OOP; Applications of Object-Oriented Programming.                                                                      |
| Week 2  | Characteristics of OOP: Objects, Classes, Encapsulation, Data Abstraction, Inheritance, Polymorphism, Dynamic Binding, Message Passing.                                         |
| Week 3  | Structure of C++ Programming Language: Basic Syntax and Structure of C++ Programs, Data Types, Variables, and Constants in C++.                                                 |
| Week 4  | Control Structures: Decision Making and Looping Constructs, Functions and Parameter Passing in C++, Arrays and Strings in C++, Pointers.<br><br><b>Test 1 on Unit I topics.</b> |
| Week 5  | Object Oriented Concepts: Class, Object, Memory Allocation for Objects, Member Functions and Data Members.                                                                      |
| Week 6  | Access Specifiers: Public, Private, Protected; Encapsulation and Data Hiding; Constructors and Destructors.                                                                     |
| Week 7  | Accessor and Mutator Functions, Friend Functions; Static Class Members; Dynamic Memory Allocation: new and delete.                                                              |
| Week 8  | Parameterized Constructors, Copy Constructors, Destructors.<br><br><b>Assignment 1: Programs on Classes, Constructors, and Destructors.</b>                                     |
| Week 9  | Inheritance: Types of Inheritance, Overriding Base Class Members in Derived Classes, Public, Protected and Private Inheritance.                                                 |
| Week 10 | Constructors and Destructors in Derived Classes, Virtual Inheritance.<br><br><b>Test 2 on Unit II topics.</b>                                                                   |
| Week 11 | Polymorphism: Function Overloading and Operator Overloading.                                                                                                                    |
| Week 12 | Overloading Unary and Binary Operators, Abstract Classes and Pure Virtual Functions.                                                                                            |

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| Week 13 | Dynamic Polymorphism, Virtual Functions.<br><br><b>Assignment 2: Programs on Inheritance and Polymorphism in C++.</b>                                               |
| Week 14 | Exception Handling: Try, Throw, Catch, Multiple Catch, Re-throwing Exceptions.                                                                                      |
| Week 15 | Exception Specifications, Processing Unexpected Exceptions, Function Templates, Overloading Template Functions.                                                     |
| Week 16 | Class Templates, Namespaces, Overview of Standard Template Library (STL).<br><br><b>Final Test covering Units III &amp; IV.</b>                                     |
| Week 17 | Revision of Unit I & II topics; Practice of Basic C++ Programs, Classes, and Constructors.                                                                          |
| Week 18 | Revision of Unit III & IV topics; Practice of Inheritance, Polymorphism, Templates, and Exception Handling.<br><br><b>Comprehensive Revision &amp; Q/A Session.</b> |

## TEACHING PLAN [B.Sc. 3rd Sem (SEC)]

(July, 2025 to November, 2025)

**Name of the Teacher: Dr. Vikas Chahar (Practical)**

**Mr. Deepak Garg (Theory)**

**Subject: Java Programming**

**Paper: 25CSC403SE01**

| Week    | Topics                                                                                                                                                                                                                                         |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Week 1  | Overview of Java: Java Features, Setting Up the Java Development Environment, Writing, Compiling, and Running a Java Program.                                                                                                                  |
| Week 2  | Java Virtual Machine (JVM) and Bytecode, Java Development Kit (JDK) and Java Runtime Environment (JRE).                                                                                                                                        |
| Week 3  | Basic Language Elements: Java Syntax and Structure, Identifiers, Keywords, Literals, Comments, Operators, Assignments.                                                                                                                         |
| Week 4  | Data Types, Variables and its Types, Constants, Expressions, Control Flow Statements: if-else, switch, loops (for, while, do-while).<br><br><b>Test 1 on Unit I topics.</b>                                                                    |
| Week 5  | Array: Initializing, Single Dimensional Array, Operation on String, Mutable & Immutable String.                                                                                                                                                |
| Week 6  | Using Collection, Base Loop for String, Creating Strings using StringBuffer.                                                                                                                                                                   |
| Week 7  | Class Fundamentals: Object, Object Life Cycle, Creating and Operating Objects, Constructor & Initialization Code Block.                                                                                                                        |
| Week 8  | Access Control, Inner Class, Abstract Class, Argument Passing Mechanism, Method Overloading, Recursion, Use of Access Modifiers with Classes & Methods.<br><br><b>Assignment 1: Programs on Classes, Constructors, and Method Overloading.</b> |
| Week 9  | Introduction to Inheritance: Use and Benefits of Inheritance in OOPs, Types of Inheritance in Java.                                                                                                                                            |
| Week 10 | Inheriting Data Members and Methods, Role of Constructors in Inheritance, Overriding Super Class Methods, Use of “super”.<br><br><b>Test 2 on Unit II topics.</b>                                                                              |

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| Week 11 | Polymorphism in Java: Compile-time and Runtime Polymorphism.                                                                                                     |
| Week 12 | Interface: Purpose of Interface, Defining and Implementing Interfaces, Interface Reference Variables.                                                            |
| Week 13 | Interface with Variables, Extending Interfaces.<br><br><b>Assignment 2: Implementing Inheritance and Interface Concepts in Java.</b>                             |
| Week 14 | Exception Handling: Types of Errors in Java, Try-Catch Blocks and Finally Clause.                                                                                |
| Week 15 | Throw and Throws Keywords, Creating Custom Exceptions, Packages: Package as Access Protection, Defining Package.                                                 |
| Week 16 | CLASSPATH Setting for Packages, Import and Naming Convention for Packages, GUI Programming.<br><br><b>Test covering Units III &amp; IV.</b>                      |
| Week 17 | Revision of Unit I & II topics; Practice of Java Basics, Control Flow, Arrays, and Classes.                                                                      |
| Week 18 | Revision of Unit III & IV topics; Practice of Inheritance, Interfaces, Exception Handling, and Packages.<br><br><b>Comprehensive Revision &amp; Q/A Session.</b> |

## TEACHING PLAN [(B.Sc. (5th Sem))]

(July, 2025 to November, 2025)

**Name of the Teacher: Dr. Vikas Chahar (Practical)**

**Mr. Deepak Garg (Theory)**

**Subject: Database Management System, Oracle and Visual Basic - I, Software Engineering - I**

**Paper: CS05**

| Week   | Topics                                                                                                                                                                                                               |
|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Week 1 | Database Concepts: File Systems Vs. DBMS, Advantages and Disadvantages of DBMS, Objectives of a Database, Database System Concepts and Architecture.                                                                 |
| Week 2 | Data Modeling for a Database: Records and Files, Abstraction and Data Integration.                                                                                                                                   |
| Week 3 | Database Management System Types: Relational, Network, and Hierarchical Models.                                                                                                                                      |
| Week 4 | Relational Data Manipulations: Relational Algebra, Relational Calculus, SQL.<br><br><b>Test 1 on Unit I topics.</b>                                                                                                  |
| Week 5 | Relational Database Design: Functional Dependencies, Finding Keys, Normalization (1NF to 3NF, BCNF).                                                                                                                 |
| Week 6 | Lossless Join and Dependency Preserving Decomposition, Computing Closures of Set FDs, Finding Keys.<br><br><b>Assignment 1: SQL Queries and Normalization Exercises.</b>                                             |
| Week 7 | Practical Database Design: Role of Information Systems, Database Design Process, Query Processing, Query Optimization, Security, Concurrency, and Recovery Techniques.<br><br><b>Test 2 on Unit II and Unit III.</b> |
| Week 8 | Introduction to Software and Software Engineering: Software Characteristics, Software Crisis, Software Engineering Paradigms, Goals and Principles of Software Engineering.                                          |
| Week 9 | Software Project Management: Planning a Software Project, Cost Estimation, Project Scheduling, Personnel Planning, Team Structure.                                                                                   |

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| Week 10 | Software Configuration Management, Software Quality and Quality Assurance, Project Monitoring, Risk Management.<br><br><b>Test 1 on Unit I topics.</b>                                                                     |
| Week 11 | Software Requirement Analysis: Structured Analysis, Object-Oriented Analysis, Data Modeling.                                                                                                                               |
| Week 12 | Software Requirement Specification, Validation, and Documentation.                                                                                                                                                         |
| Week 13 | Design and Implementation of Software: Software Design Fundamentals and Principles.                                                                                                                                        |
| Week 14 | Design Methodology: Structured Design and Object-Oriented Design; Design Strategies and Verification.<br><br><b>Assignment 1: Prepare a mini software project plan including requirement analysis and design document.</b> |
| Week 15 | Monitoring and Control, Coding and Programming Styles.<br><br><b>Test 2 on Unit II and Unit III.</b>                                                                                                                       |
| Week 16 | Comprehensive Practice: Applying Software Design and Implementation Principles to Case Studies.                                                                                                                            |
| Week 17 | Revision for Database Management System, Oracle and Visual Basic – I.                                                                                                                                                      |
| Week 18 | Revision for Software Engineering – I.<br><br><b>Comprehensive Revision &amp; Q/A Session.</b>                                                                                                                             |

## TEACHING PLAN [B.A. 1st Sem (VAC)]

(July, 2025 to November, 2025)

**Name of the Teacher: Dr. Vikas Chahar (Theory & Practical)**

**Mr. Deepak Garg (Theory & Practical)**

**Subject: Digital and Technological Solutions**

**Paper: 23CSAX01VA01**

| Week    | Topics                                                                                                                                                                                                                    |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Week 1  | Introduction & Evolution of Digital System: Role & Significance of Digital Technology; Information and Communication Technology (ICT) & Tools.                                                                            |
| Week 2  | Computer System and its Working; Software and its Types.                                                                                                                                                                  |
| Week 3  | Operating Systems: Types and Functions.                                                                                                                                                                                   |
| Week 4  | Problem Solving: Algorithms and Flowcharts.<br><b>Test 1 on Unit I topics.</b>                                                                                                                                            |
| Week 5  | Communication Systems: Principles and Models; Transmission Media.                                                                                                                                                         |
| Week 6  | Computer Networks & Internet: Concepts and Applications, WWW, Web Browsers, Search Engines.                                                                                                                               |
| Week 7  | Messaging, Email, and Social Networking.                                                                                                                                                                                  |
| Week 8  | Computer Based Information System: Significance & Types; E-Commerce and Digital Marketing – Basic Concepts, Benefits & Challenges.<br><b>Assignment 1: Prepare a report on E-Commerce or Digital Marketing platforms.</b> |
| Week 9  | Emerging Technologies and their Applications: Overview of Artificial Intelligence, Machine Learning, and Deep Learning.                                                                                                   |
| Week 10 | Big Data, Data Science and Big Data Analytics, Internet of Things (IoT) and Industrial Internet of Things (IIoT).<br><b>Test 2 on Unit II topics.</b>                                                                     |
| Week 11 | Robotics and 3D Printing, Blockchain Technology.                                                                                                                                                                          |

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| Week 12 | Quantum Computing; Cloud Computing and its Service Models.                                                                                                         |
| Week 13 | Applications of Emerging Technologies in various sectors.<br><br><b>Assignment 2: Prepare a presentation on any one Emerging Technology (AI, IoT, Blockchain).</b> |
| Week 14 | Digital India and e-Governance: Initiatives, Infrastructure, Services and Empowerment.                                                                             |
| Week 15 | Digital Financial Tools: UPI, Aadhar Enabled Payment System, USSD, Credit/Debit Cards, e-Wallets, Internet Banking, NEFT/RTGS, IMPS, Online Bill Payment, POS.     |
| Week 16 | Cyber Security: Threats, Significance, Challenges, Precautions, Safety Measures and Tools.<br><br><b>Test covering Units III &amp; IV.</b>                         |
| Week 17 | Revision of Unit I & II topics.                                                                                                                                    |
| Week 18 | Revision of Unit III & IV topics.<br><br><b>Comprehensive Revision &amp; Q/A Session.</b>                                                                          |



## TEACHING PLAN [B.A. 1st Sem (MDC)]

(July, 2025 to November, 2025)

**Name of the Teacher: Dr. Vikas Chahar**

**Subject: Fundamentals of Computing**

**Paper: 24CSCX01MD01**

| Week    | Topics                                                                                                                                                                                                                                                                            |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Week 1  | Introduction: Historical Evolution of Computing; Computers and their Classification; Working of a Computer; Block Diagram and its Components.                                                                                                                                     |
| Week 2  | Characteristics, Benefits and Limitations of Computers; Human Being Vs Computer; Computer Codes and their Types.                                                                                                                                                                  |
| Week 3  | Input and Output Devices: Introduction to I/O Concepts; Hardcopy and Softcopy Devices; Keyboards, Mouse, Joysticks, Trackballs, Digitizer, Voice-Recognition, Optical-Recognition.                                                                                                |
| Week 4  | Scanners, Terminals, Point-of-Sale Terminals, Machine-Vision Systems, Printer & its Types.<br><br><b>Test 1 on Unit I topics.</b>                                                                                                                                                 |
| Week 5  | Memory & Mass Storage Devices: Characteristics of Memory Systems, Types of Memory, RAM, ROM.                                                                                                                                                                                      |
| Week 6  | Magnetic Disks: Floppy Disk, Hard Disk; Optical Disks; Magnetic Tapes; Concepts of Virtual and Cache Memory.                                                                                                                                                                      |
| Week 7  | Software and Operating System Concepts: Introduction, Software and its Types, Language Translators, Operating System and its Functions.                                                                                                                                           |
| Week 8  | Measuring System Performance; Assemblers, Compilers, and Interpreters; Batch Processing, Multiprogramming, Multi-tasking, Multiprocessing, Time Sharing, DOS, Windows, Unix/Linux.<br><br><b>Assignment 1: Prepare a comparative study report on different Operating Systems.</b> |
| Week 9  | Problem Solving and Programming Languages: Concept of Problem Solving, Problem Definition, Programming Languages and their Classification.                                                                                                                                        |
| Week 10 | Problem Solving with Computer; Concept of Programming and Design Techniques; Computer Program Lifecycle and Program Development Process.<br><br><b>Test 2 on Unit II topics.</b>                                                                                                  |

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| Week 11 | Data Communication: Introduction, Forms of Data Transmission, Modem and its Types, Communication Channels, Data Transmission Modes.                                                                                                                                       |
| Week 12 | Computer Networks: Introduction to Computer Network, Types of Computer Network, Network Topologies, Network Protocols, Applications of Computer Networks.<br><br><b>Assignment 2: Create a diagram showing different Network Topologies and explain their advantages.</b> |
| Week 13 | Internet: Introduction to Internet, WWW, Web Browsers, Evolution of Internet, Applications of Internet.                                                                                                                                                                   |
| Week 14 | Connecting to Internet, Internet Tools; Electronic Mail: Introduction to E-mail, Setting Up an E-mail Account, Composing and Sending E-mails.                                                                                                                             |
| Week 15 | E-mail Etiquette and Best Practices, Managing E-mails, Security and Privacy, Advanced Features, Troubleshooting Common Issues;                                                                                                                                            |
| Week 16 | Computer Applications: Artificial Intelligence, Banking, Education, Marketing, Desktop Publishing, CAD/CAM, Project Management, Military, Sports, Research & Development.<br><br><b>Final Test covering Units III &amp; IV.</b>                                           |
| Week 17 | Revision of Unit I & II topics.                                                                                                                                                                                                                                           |
| Week 18 | Revision of Unit III & IV topics.<br><br><b>Comprehensive Revision &amp; Q/A Session.</b>                                                                                                                                                                                 |

## TEACHING PLAN (BCA 3<sup>rd</sup> Sem)

(July, 2025 to November, 2025)

**Name of the Teacher: Mr. Deepak Garg**

**Subject: Database Management System**

**Paper: 26BCA403DS02**

| Week    | Topics                                                                                                                                                                                                                                  |
|---------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Week 1  | Introduction to Databases: Definition of Data, Database, and DBMS; Overview of Database Applications; Advantages and Disadvantages of DBMS; Roles of Database Users and Administrators.                                                 |
| Week 2  | Data Models: Introduction to Data Models, Types of Data Models (Hierarchical, Network, Relational, Object-oriented), Importance of Data Models in DBMS.                                                                                 |
| Week 3  | Database Design: Keys – Primary, Candidate, Super, Foreign, Composite, Alternate, Unique, Surrogate; Constraints – Primary Key, Foreign Key, Unique Key, NOT NULL, CHECK; Entity-Relationship (ER) Model, Entities and Attributes.      |
| Week 4  | ER Diagrams, Key Constraints and Weak Entity Sets, Extended ER Features, Introduction to the Relational Model and Relational Schema.<br><br><b>Test 1 on Unit I topics.</b>                                                             |
| Week 5  | Relational Algebra and Calculus: Introduction, Operations – Selection, Projection, Set Operations, Join, Division, Tuple and Domain Relational Calculus.                                                                                |
| Week 6  | Structured Query Language (SQL): SQL Basics – DDL and DML, Aggregate Functions (MIN, MAX, SUM, AVG, COUNT), Logical Operators (AND, OR, NOT), Predicates (LIKE, BETWEEN, ALIAS, DISTINCT).                                              |
| Week 7  | Clauses (GROUP BY, HAVING, ORDER BY, TOP/LIMIT); Types of Joins (Inner, Outer, Left, Right, Full, Equi Join).                                                                                                                           |
| Week 8  | Advanced SQL: Analytical Queries, Hierarchical Queries, Recursive Queries, Views, Cursors, Stored Procedures and Functions, Packages, Triggers, Dynamic SQL.<br><br><b>Assignment 1: SQL Queries and Relational Algebra Operations.</b> |
| Week 9  | Normalization and Database Design: Functional Dependencies, Armstrong's Axioms, Definition and Properties (Reflexivity, Augmentation, Transitivity).                                                                                    |
| Week 10 | Types of Functional Dependencies, Normal Forms (1NF, 2NF, 3NF, BCNF), Denormalization.                                                                                                                                                  |

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|         | <b>Test 2 on Unit II topics.</b>                                                                                                                                                                                                                         |
| Week 11 | Transaction Management: ACID Properties, Transactions and Schedules, Concurrent Execution of Transactions, Lock-Based Concurrency Control.                                                                                                               |
| Week 12 | Performance of Locking, Transaction Support in SQL, Introduction to Crash Recovery, 2PL, Serializability, and Recoverability.                                                                                                                            |
| Week 13 | Introduction to Lock Management, Dealing with Deadlocks.<br><br><b>Assignment 2: Implementation of Transactions and Locking Mechanisms.</b>                                                                                                              |
| Week 14 | Database Storage and Indexing: Data on External Storage, File Organizations and Indexing, Index Data Structures.                                                                                                                                         |
| Week 15 | Comparison of File Organizations, Indexes and Performance Tuning, Guidelines for Index Selection, Basic Examples of Index Selection.                                                                                                                     |
| Week 16 | NoSQL Databases and Big Data: Introduction to NoSQL, Data Models (Document, Key-Value, Column Family, Graph), Features and Uses of NoSQL Document Databases, CAP Theorem, BASE vs ACID, CRUD Operations.<br><br><b>Test covering Units III &amp; IV.</b> |
| Week 17 | Revision of Unit I & II topics.                                                                                                                                                                                                                          |
| Week 18 | Revision of Unit III & IV topics.<br><br><b>Comprehensive Revision &amp; Q/A Session.</b>                                                                                                                                                                |