**NAME OF THE FACULTY: Ms.ESHA BANSAL**

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| DATE | CLASS: B.C.A. III  SUBJECT:Software Engineering  B23-CAP-501 | CLASS: B. A. I  SUBJECT:Basic IT Tools  B23-SEC-103 | CLASS: B.C.A. II  SUBJECT: Linux and Shell Programming  BCA23-CC302 | CLASS: BCA I  SUBJECT: DISCRETE STRUCTURE(SHARED)  BCA23-M101 |
| Aug 2025 | Introduction: Program vs. Software, Software Engineering, Programming paradigms, Software Crisis – problem and causes, Phases in Software development: Requirement Analysis, Software Design, Coding, Testing, Maintenance, Software Development Process Models: Waterfall, Prototype, Evolutionary and Spiral models, Role of Metrics. | Introduction to Computer: Computer and Latest IT gadgets, Evolution of Computers & its applications, Basics of Hardware and Software, Application Software, Systems Software, Utility Software. Central Processing Unit, Input devices, Output devices, Computer Memory & storage, Mobile Apps.  Introduction to Operating System, Functions of the Operating system, Operating Systems for Desktop and Laptop, Operating Systems for Mobile Phone and Tablets, User Interface for Desktop and Laptop, | Introduction to Linux: Linux distributions, Overview of Linux operating system, Linux architecture, Features of Linux, Accessing Linux system, Starting and shutting down system, Logging in and Logging out, Comparison of Linux with other operating systems.  Commands in Linux: General-Purpose commands, File oriented commands, directory oriented commands, | An introduction to matrices and their types, Operations on matrices, Symmetric and skew-symmetric matrices, Minors, Co-factors. Determinant of a square matrix, Adjoint and inverse of a square matrix, |
| Sept 2025 | Feasibility Study, Software Requirement Analysis and Specifications: SRS**,** Need for SRS, Characteristics of an SRS, Components of an SRS**,** Problem Analysis**,** Information gathering tools, Requirement specification, validation and metrics.  Structured Analysis and Tools: Data Flow Diagram, Data Dictionary, Decision table, Decision trees, Structured English, Entity-Relationship diagrams | Task Bar, Icons & shortcuts, Running an Application, Operating System Simple Setting, Changing System Date and Time, Changing Display Properties, To Add or Remove Program and Features, Adding, Removing & Sharing Printers, File and Folder Management.  Introduction to Internet and World Wide Web, Basic of Computer Networks, Local Area Network (LAN), Wide Area Network (WAN), | Communication-oriented commands, process oriented commands, etc. Introducing regular expressions.  Regular expressions & Filters in Linux: Simple filters viz. more, wc, diff, sort, uniq, grep  Linux file system: Linux files, inodes and structure and file system, file system components, standard file system, file system types. | Introduction to counting: Basic counting techniques - inclusion and exclusion, pigeonhole principle, permutation, combination. |
| Oct 2025 | Software Project Planning:Cost estimation: COCOMO model, Project scheduling, Staffing, and personnel planning, team structure, Software configuration management, Quality assurance plans, Project monitoring plans, Risk Management.  Software Design:Design fundamentals, problem partitioning, and abstraction, design methodology, Cohesion & Coupling. | Network Topology, Internet, Applications of Internet, Website Address and URL, Popular Web Browsers (Internet Explorer/Edge, Chrome, Mozilla Firefox, Opera etc.), Popular Search Engines, Searching on the Internet.  E-mail: Using E-mails, Opening Email account, Mailbox: Inbox and Outbox | Processes in Linux: Starting and Stopping Processes, Initialization Processes, Mechanism of process creation, Job control in linux using at, batch, cron& time. Shell Programming: vi editor, shell variables, I/O in shell, control structures, loops, subprograms | Trees - Gener il trees, directed trees, ordered trees, rooted trees, Binary tree, Infix, prefix & postfix representation of trees |
| Nov 2025 | Software testing strategies: unit testing, integration testing, Validation testing, System testing, Alpha and Beta testing.  Software Maintenance: Type of maintenance,Management of Maintenance, Maintenance Process, maintenance characteristics. | Creating and Sending a new Email, replying to an E-mail message, forwarding an E-mail message, searching emails, Attaching files with email, Email Signature. Social Networking: Facebook, Twitter, LinkedIn, Instagram, Instant Messaging FacebookMessenger, Introduction to Blogs, Digital Locker. | Creating & executing shell scripts in linux. | Graphs: Basic terminology, Subgraph, Directed & undirected graph, Labeled graphs, Weighted graphs, Representation of graphs |

**NAME OF THE FACULTY: MS PRIYANKA**

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| DATE | CLASS: BSc I & BA I  SUBJECT: Logical Organization of Computer   |  | | --- | | B23-CC-C1 | | CLASS: BCA II  SUBJECT: Java OOP Foundations  BCA-23-CC301 | CLASS: B. A. I  SUBJECT: Basic IT Tools  B23-SEC-103 | CLASS: BCA I  SUBJECT: DISCRETE STRUCTURE(SHARED)  BCA23-M101 |
| Aug | Number Systems: Binary, Octal, Hexadecimal etc. Conversions from one number system to another, BCD Number System. BCD Codes: Natural Binary Code, Weighted Code, Self-Complimenting Code, Cyclic Code.  Error Detecting and Correcting Codes. Character representations: ASCII, EBCDIC and Unicode.  Number Representations: Integer numbers - sign-magnitude, 1’s &amp; 2’s complement representation. Real Numbers normalized floating point representations | Object Oriented Programming and Java Fundamentals: Structure of Java programs, Classes and Objects, Data types, Type Casting, Looping Constructs | Introduction to Computer: Computer and Latest IT gadgets, Evolution of Computers & its applications, Basics of Hardware and Software, Application Software, Systems Software, Utility Software. Central Processing Unit, Input devices, Output devices, Computer Memory & storage, Mobile Apps.  Introduction to Operating System, Functions of the Operating system, Operating Systems for Desktop and Laptop, Operating Systems for Mobile Phone and Tablets, User Interface for Desktop and Laptop, |  |
| Sept | Binary Arithmetic: Binary Addition, Binary Subtraction, Binary Multiplication, Binary Division using 1’s and 2’s Compliment representations, Addition and subtraction with BCD representations.  Boolean Algebra: Boolean Algebra Postulates, basic Boolean Theorems, Boolean Expressions, Boolean Functions, Truth Tables, Canonical Representation of Boolean Expressions: SOP and POS, Simplification of Boolean Expressions using Boolean Postulates &amp; Theorems, Kaurnaugh-Maps (upto four variables), Handling Don’t Care conditions | Interfaces: Interface basics; Defining, implementing and extending interfaces; Implementing multiple inheritance using interfaces Packages: Basics of packages, Creating and accessing packages, System packages, Creating user defined packages | Task Bar, Icons & shortcuts, Running an Application, Operating System Simple Setting, Changing System Date and Time, Changing Display Properties, To Add or Remove Program and Features, Adding, Removing & Sharing Printers, File and Folder Management.  Introduction to Internet and World Wide Web, Basic of Computer Networks, Local Area Network (LAN), Wide Area Network (WAN), |  |
| Oct | Logic Gates: Basic Logic Gates – AND, OR, NOT, Universal Gates – NAND, NOR, Other Gates – XOR, XNOR etc. Their symbols, truth tables and Boolean expressions.  Combinational Circuits: Design Procedures, Half Adder, Full Adder, Half Subtractor, Full Subtracor, Multiplexers, Demultiplexers, Decoder, Encoder, Comparators, Code Converters | Exception handling using the main keywords of exception handling: try, catch, throw, throws and finally; Nested try, multiple catch statements, creating user defined exceptions. File Handling Byte Stream, Character Stream, File I/O Basics, File Operations | Network Topology, Internet, Applications of Internet, Website Address and URL, Popular Web Browsers (Internet Explorer/Edge, Chrome, Mozilla Firefox, Opera etc.), Popular Search Engines, Searching on the Internet.  E-mail: Using E-mails, Opening Email account, Mailbox: Inbox and Outbox |  |
| Nov | Sequential Circuits: Basic Flip- Flops and their working. Synchronous and Asynchronous Flip –Flops, Triggering of Flip-Flops, Clocked RS, D Type, JK, T type and Master-Slave Flip-Flops. State Table, State Diagram and State Equations.Flip-flops characteristics & Excitation tables.Sequential Circuits: Designing registers –Serial-In Serial-Out (SISO), Serial-In Parallel-Out (SIPO), Parallel-In Serial-Out (PISO) Parallel-In Parallel-Out (PIPO) and shift registers | AWT and Event Handling: The AWT class hierarchy, Events, Event sources, Event classes, Event Listeners, Relationship between Event sources and Listeners, Delegation event model, Creating GUI applications using AWT. | Creating and Sending a new Email, replying to an E-mail message, forwarding an E-mail message, searching emails, Attaching files with email, Email Signature. Social Networking: Facebook, Twitter, LinkedIn, Instagram, Instant Messaging FacebookMessenger, Introduction to Blogs, Digital Locker. |  |

**NAME OF THE FACULTY: Dr. Himanshu Garg**

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| **DATE** | **TOPICS TO BE COVERED** | | |  |
| **BCA 1st Sem. (NEP)**  **SUBJECT: Foundations of Computers**  **BCA23-CC102** | **B.Sc. Phy. Sci. & B.A. CS 5th Sem (NEP)**  **SUBJECT: Web Designing**  **B23-CC-M6** | **B.C.A. 3rd Sem.(NEP)**  **SUBJECT: BASIC CONCEPT OF UML**  **BCA23-M301** | **B.C.A. 3rd Sem (NEP)**  **SUBJECT: ADVANCE IT SKILLS (SEC)**  **B23-SEC-301** |
| **Aug 2025** | **UNIT-I** Computer Fundamentals: Evolution of Computers through generations, Characteristics of Computers, Strengths and Limitations of Computers, Classification of Computers, Functional Components of a Computer System, Applications of computers in Various Fields. Types of Software: System software, Application software, Utility Software, Shareware, Freeware, Firmware, Free Software.  Memory Systems: Concept of bit, byte, word, nibble, storage locations and addresses, measuring units of storage capacity, access time, concept of memory hierarchy. Primary Memory RAM, ROM, PROM, EPROM. Secondary Memory - Types of storage devices, Magnetic Tape, Hard Disk, Optical Disk, Flash Memory. | **UNIT-I**  Introduction to Internet and World Wide Web; Evolution and History of World Wide Web; Basic Features; Web Browsers; Web Servers; Hypertext Transfer Protocol; URLS; Searching and Web- Casting Techniques; Search Engines and Search Tools | **Unit – III**  System Design: Overview, Estimating Performance, Making a reuse plan | **UNIT-I**  Introduction to Computer: AI based Computers, Evolution of Computers & its applications, Advanced Hardware and Software, importance of AI in Application Software, Systems Software, Utility Software. Graphics Processing Unit, Input devices, Output devices, Computer Memory & storage, Mobile Apps. |
| **Sep. 2025** | **UNIT-II** I/O Devices: I/O Ports of a Desk Top Computer, Device Controller, Device Driver. Input Devices: classification and use, keyboard, pointing devices mouse, touch pad and track ball, joystick, magnetic stripes, scanner, digital camera, and microphone Output Devices: speaker, monitor, printers: classification, laser, ink jet, dot- matrix. Plotter.  Introduction to Operating System: Definition, Functions, Features of Operating System, Icon, Folder, File, Start Button, Task Bar, Status Buttons, Folders, Shortcuts, Recycle Bin, Desktop, My Computer, My Documents, Windows Explorer, Control Panel. | **UNIT-II**  Steps for Developing Website; Choosing the Contents; Home Page; Domain Names; Internet Service Provider; Planning and Designing Web Site; Creating a Website; Web Publishing: Hosting Site; | Breaking a system into subsystems, Identifying Concurrency, Allocation of subsystem, Management of data storage, Handling global resources. | **UNIT-II**  Introduction to Operating System: Definition, User oriented functions of the Operating system, Different types of Operating Systems, Advanced features of Operating Systems for Mobile Phone and Tablets, Components of User Interface, Status Bar, Tool bar, Icons and their movement, Using Shortcuts, Control Panel in Operating System, Adding and removing apps on system. |
| **Oct. 2025** | **UNIT-III**  The Internet: Introduction to networks and internet, history, Internet, Intranet & Extranet, Working of Internet, Modes of Connecting to Internet.  Electronic Mail: Introduction, advantages and disadvantages, User Ids, Passwords, e-mail addresses, message components, message composition, mailer features. Browsers and search engines. | **UNIT-III**  Introduction to HTML; Hypertext and HTML; HTML Document Features;  HTML Tags; Header, Title, Body, Paragraph, Ordered/Unordered Line, Creating Links; Headers; Text Styles; Text Structuring; Text Colors and Background; Formatting Text; Page layouts; Insertion of Text, Movement of Text | **UNIT- IV**  Interaction Modeling: Use Case Models: Actors, Use case, Use case diagram, Guidelines for use case diagram. | **UNIT-III**  Introduction to Internet: Computer Networks, Network Topologies, Intranet, Features of Internet and Intranet, URL and its components, Web Browsers and their useful tools, A.I based searching tools. |
| **Nov. 2025** | **UNIT-IV**  Threats: Physical & non-physical threats, Virus, Worm, Trojan, Spyware, Keylogers, Rootkits, Adware, Cookies, Phishing, Hacking, Cracking.  Computer Security Fundamentals: Confidentiality, Integrity, Authentication, Non-Repudiation, Security Mechanisms, Security Awareness, Security Policy, anti-virus software & Firewalls, backup & recovery. | **UNIT-IV**  Images: Types of Images, Insertion of Image, Movement of Image, Ordered and Unordered lists; Inserting Graphics; Table Handling Functions like Columns, Rows, Width, Colours; Frame Creation and Layouts; Working with Forms and Menus; Working with Buttons like Radio, Check Box; | Sequence Model: Scenarios, Sequence Diagrams, Guidelines for Sequence model.  Activity Model: Activities, Branches, Initiation & Termination, Concurrent Activities, | **UNIT-IV**  E-mail: Definition of E-mails, Advantages and Disadvantages, Various features in Email account, Trash, Spam, Draft, Scheduled e-mails, replying options, Differentiate between sending and forwarding an E-mail, Searching criteria for emails, Limits of size of attaching files with email and their alternatives, Digital Signature. |

**NAME OF THE FACULTY: Dr. SONAL JAIN**

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| DATE | CLASS: BCA-III  SUBJECT:  Back-end Development  B23-CAP-502   |  | | --- | |  | | CLASS: BCA III  SUBJECT:  Network Infrastructure and Data Communication Technologies  B23-CAP-503 | CLASS: B. A. I  SUBJECT: Basic IT Tools  B23-SEC-103 | CLASS: BCA II  SUBJECT: BASIC CONCEPT OF UML |
| Aug | Introduction to back-end Development: Overview of backend, Client-server architecture, Introduction to web servers and database  Programming Languages and Tools: Introduction to server-side languages (e.g., Node.js, or PHP), Syntax and semantics of chosen server-side language | Introduction to Data Communication and Computer Networks; Uses of Computer Networks; Types of Computer Networks and their Topologies;  Network Hardware Components: Connectors, Transceivers, Repeaters, Hubs, Network Interface Cards and PC Cards, Bridges, Switches, Routers, Gateways;  Network Software: Network Design issues and Protocols; Connection-Oriented and Connectionless Services; OSI Reference Model; TCP/IP Model | Introduction to Computer: Computer and Latest IT gadgets, Evolution of Computers & its applications, Basics of Hardware and Software, Application Software, Systems Software, Utility Software. Central Processing Unit, Input devices, Output devices, Computer Memory & storage, Mobile Apps.  Introduction to Operating System, Functions of the Operating system, Operating Systems for Desktop and Laptop, Operating Systems for Mobile Phone and Tablets, User Interface for Desktop and Laptop, | Introduction: Object-Orientation, Modeling, Class Modeling: Object, Class. |
| Sept | Programming Languages: Version control with Git, Introduction to IDEs (Integrated Development Environments) of chosen language, Writing and executing basic server-side scripts  Performance Optimization and Security: Caching strategies, Query optimization | Analog and Digital Communications Concepts: Analog and Digital data and signals; Bandwidth and Data Rate, Capacity, Baud Rate; Guided and Wireless Transmission Media; Communication Satellites; Switching and Multiplexing; Modems and modulation techniques | Task Bar, Icons & shortcuts, Running an Application, Operating System Simple Setting, Changing System Date and Time, Changing Display Properties, To Add or Remove Program and Features, Adding, Removing & Sharing Printers, File and Folder Management.  Introduction to Internet and World Wide Web, Basic of Computer Networks, Local Area Network (LAN), Wide Area Network (WAN), | Value & Attributes, Operation & Method, Link & Association, Qualified association, Multiplicity, Association end name, Ordering, Generalization & inheritance,. |
| Oct | Database Management: Introduction to databases and DBMS (SQL and NoSQL), Designing a database schema, CRUD operations (Create, Read, Update, Delete), Connecting applications to a database | Data Link Layer Design issues; Error Detection and Correction methods;  Sliding Window Protocols: One-bit, Go Back N, and Selective Repeat;  Media Access Control: ALOHA, Slotted ALOHA, CSMA, Collision free protocols;  Introduction to LAN technologies: Ethernet, Switched Ethernet, Fast Ethernet, Gigabit Ethernet; Token Ring; Introduction to Wireless LANs and Bluetooth; | Network Topology, Internet, Applications of Internet, Website Address and URL, Popular Web Browsers (Internet Explorer/Edge, Chrome, Mozilla Firefox, Opera etc.), Popular Search Engines, Searching on the Internet.  E-mail: Using E-mails, Opening Email account, Mailbox: Inbox and Outbox | ,Class Modeling: Graphical Structure of Object & Class, Association, Aggregation, Abstract Class, Multiple Inheritance, Metadata. State Modeling: Events, States, Transition & Conditions. |
| Nov | Server-Side Frameworks: Overview of popular server-side frameworks (e.g., Express.js, or Laravel), Building a simple application using a framework.  API Development: RESTful API concepts, Designing and documenting APIs, Authentication and authorization basics  Web security best practices (SQL injection, XSS, CSRF) | Routing Algorithms: Flooding, Shortest Path Routing, Distance Vector Routing; Link State Routing, Hierarchical Routing; Congestion Control; Traffic shaping; Choke packets; Load shedding;  Application Layer: Introduction to DNS, E-Mail, and WWW services;  Network Security Issues: Security attacks; Encryption methods; Firewalls; Digital Signatures | Creating and Sending a new Email, replying to an E-mail message, forwarding an E-mail message, searching emails, Attaching files with email, Email Signature. Social Networking: Facebook, Twitter, LinkedIn, Instagram, Instant Messaging Facebook Messenger, Introduction to Blogs, Digital Locker. | State Dinpram. State Diagram. State Modeling: Nested State Diagram, Nested States. |

**NAME OF THE FACULTY: MS JYOTI**

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| DATE | CLASS: BCA-I  SUBJECT: Logical Organization of Computer   |  | | --- | | BCA23-CC103 | | CLASS: B.Sc –II & B.A- II  SUBJECT: DATA STRUCTURE | CLASS: B. A. I  SUBJECT:Basic IT Tools  B23-SEC-103 | CLASS: BCA III  SUBJECT:   |  | | --- | | Animation |  |  | | --- | | B23-VOC-101 | |
| Aug | Number Systems: Binary, Octal, Hexadecimal etc. Conversions from one number system to another, BCD Number System. BCD Codes: Natural Binary Code, Weighted Code, Self-Complimenting Code, Cyclic Code.  Error Detecting and Correcting Codes. Character representations: ASCII, EBCDIC and Unicode.  Number Representations: Integer numbers - sign-magnitude, 1’s &amp; 2’s complement representation. Real Numbers normalized floating point representations | Data Structure Definition, Data Type vs. Data Structure, Classification of Data Structures, Data Structure Operations, Applications of Data Structures; Algorithm Specifications: Performance Analysis and Measurement (Time and Space Analysis of Algorithms- Average, Best and Worst Case Analysis. | Introduction to Computer: Computer and Latest IT gadgets, Evolution of Computers & its applications, Basics of Hardware and Software, Application Software, Systems Software, Utility Software. Central Processing Unit, Input devices, Output devices, Computer Memory & storage, Mobile Apps.  Introduction to Operating System, Functions of the Operating system, Operating Systems for Desktop and Laptop, Operating Systems for Mobile Phone and Tablets, User Interface for Desktop and Laptop, |  |
| Sept | Binary Arithmetic: Binary Addition, Binary Subtraction, Binary Multiplication, Binary Division using 1’s and 2’s Compliment representations, Addition and subtraction with BCD representations.  Boolean Algebra: Boolean Algebra Postulates, basic Boolean Theorems, Boolean Expressions, Boolean Functions, Truth Tables, Canonical Representation of Boolean Expressions: SOP and POS, Simplification of Boolean Expressions using Boolean Postulates &amp; Theorems, Kaurnaugh-Maps (upto four variables), Handling Don’t Care conditions | Arrays: Introduction, Linear Arrays, Representation of Linear Array In Memory, Two Dimensional and Multidimensional Arrays, Sparse Matrix and its Representation, Operations on Array: Algorithm for Traversal, Selection, Insertion, Deletion and its implementation. String Handling: Storage of Strings, Operations on Strings viz., Length, Concatenation, Substring, Insertion, Deletion. Replacement. Linked List: Introduction, Array vs. linked list, Representation of linked lists in Memory, Traversing a Linked List, Insertion, Deletion, Searching into a Linked list, Type of Linked List. | Task Bar, Icons & shortcuts, Running an Application, Operating System Simple Setting, Changing System Date and Time, Changing Display Properties, To Add or Remove Program and Features, Adding, Removing & Sharing Printers, File and Folder Management.  Introduction to Internet and World Wide Web, Basic of Computer Networks, Local Area Network (LAN), Wide Area Network (WAN), |  |
| Oct | Logic Gates: Basic Logic Gates – AND, OR, NOT, Universal Gates – NAND, NOR, Other Gates – XOR, XNOR etc. Their symbols, truth tables and Boolean expressions.  Combinational Circuits: Design Procedures, Half Adder, Full Adder, Half Subtractor, Full Subtracor, Multiplexers, Demultiplexers, Decoder, Encoder, Comparators, Code Converters | Stack: Array Representation of Stack, Linked List Representation of Stack, Algorithms for Push and Pop, Application of Stack: Polish Notation, Postfix Evaluation Algorithms, Infix to Postfix Conversion, Infix to Prefix Conversion, Recursion | Network Topology, Internet, Applications of Internet, Website Address and URL, Popular Web Browsers (Internet Explorer/Edge, Chrome, Mozilla Firefox, Opera etc.), Popular Search Engines, Searching on the Internet.  E-mail: Using E-mails, Opening Email account, Mailbox: Inbox and Outbox |  |
| Nov | Sequential Circuits: Basic Flip- Flops and their working. Synchronous and Asynchronous Flip –Flops, Triggering of Flip-Flops, Clocked RS, D Type, JK, T type and Master-Slave Flip-Flops. State Table, State Diagram and State Equations.Flip-flops characteristics & Excitation tables.Sequential Circuits: Designing registers –Serial-In Serial-Out (SISO), Serial-In Parallel-Out (SIPO), Parallel-In Serial-Out (PISO) Parallel-In Parallel-Out (PIPO) and shift registers | Introduction to Queues: Simple Queue, Double Queue, Circular Queue, Priority Queue, Representation of Queues as Linked List and Array, Applications of Queue. Algorith on Insertion and Deletion in Simple Queue and Circular Queue. | Creating and Sending a new Email, replying to an E-mail message, forwarding an E-mail message, searching emails, Attaching files with email, Email Signature. Social Networking: Facebook, Twitter, LinkedIn, Instagram, Instant Messaging FacebookMessenger, Introduction to Blogs, Digital Locker. |  |

**Course:** BCA 3rdsemester

**Subject:**Data Base Technologies

**Faculty Name:**Mr. Ashish Kumar

**Subject Code:** BCA-23-CC303

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| **Month** | **Syllabus** |
| August 2025 | Basic Concepts-Data, Information, Records, Files, Schema and Instance etc. Limitations of File Based Approach, Characteristics of Database Approach, Database Management System (DBMS), DBMS Components & Functions, Database Interfaces, Advantages and Disadvantages of DBMS. Database Users: Data and Database Administrator, Role and Responsibilities of Database Administrator, Database Designers, Application Developers etc. |
| Sept. 2025 | Data Models: Hierarchical, Network and Relational Data Models. Entity-Relationship Model: Entity, Entity Sets, Entity Type, Attributes: Type of Attributes, Keys, Integrity Constraints, Designing of ER Diagram, Symbolic Notations for Designing ER Diagram |
| Oct. 2025 | SQL: Meaning, Purpose and Need of SQL, Data Types, SQL Components: DDL, DML, DCL and DQL, Basic Queries, Join Operations and Sub-queries, Views, Specifying Indexes. Constraints and its Implementation in SQL Relational Algebra: Basic Operations: Select, Project, Join, Union, Intersection, Difference, and Cartesian Product etc. |
| Nov. 2025 | Relational Model: Functional Dependency, Characteristics, Inference Rules for Functional Dependency, Types of Functional Dependency, Normalization: Benefits and Need of Normalization, Normal Forms Based on Primary Keys-INF,2NF,3NF. |

**Course:** BCA 1stsemester

**Subject:**Basic IT Tools

**Faculty Name:**Mr. Ashish Kumar

**Subject Code:** B23-SEC-103

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| **Month** | **Syllabus** |
| August 2025 | Introduction to Computer: Computer and Latest IT gadgets, Evolution of Computers & its applications, Basics of Hardware and Software, Application Software, Systems Software, Utility Software. Central Processing Unit, Input devices, Output devices, Computer Memory & storage, Mobile Apps. |
| Sept. 2025 | Introduction to Operating System, Functions of the Operating system, Operating Systems for Desktop and Laptop, Operating Systems for Mobile Phone and Tablets, User Interface for Desktop and Laptop, Task Bar, Icons & shortcuts, Running an Application, Operating System Simple Setting, Changing System Date and Time, Changing Display Properties, To Add or Remove Program and Features, Adding, Removing & Sharing Printers, File and Folder Management. |
| Oct.2025 | Introduction to Internet and World Wide Web, Basic of Computer Networks, Local Area Network (LAN), Wide Area Network (WAN), Network Topology, Internet, Applications of Internet, Website Address and URL, Popular Web Browsers (Internet Explorer/Edge, Chrome, Mozilla Firefox, Opera etc.), Popular Search Engines, Searching on the Internet. |
| Nov. 2025 | E-mail: Using E-mails, Opening Email account, Mailbox: Inbox and Outbox, Creating and Sending a new Email, replying to an E-mail message, forwarding an E-mail message, searching emails, Attaching files with email, Email Signature. Social Networking: Facebook, Twitter, LinkedIn, Instagram, Instant Messaging (WhatsApp, Facebook Messenger, Telegram), Introduction to Blogs, Digital Locker. |

**Course:** BCA 3rdsemester

**Subject:** Problem Solving through C

**Faculty Name:** Mr. Ashish Kumar

**Subject Code:** BCA-23-CC101

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| **Month** | **Syllabus** |
| August 2025 | Overview of C: History, Importance, Structure of C Program, Character Set, Constants and Variables, Identifiers and Keywords, Data Types, Assignment Statement, Symbolic Constant.  Input/output: Formatted I/O Function-, Input Functions viz. scanf(), getch(), getche(), getchar(), gets(),  output functions viz. printf(), putch(), putchar(), puts(). |
| Sept. 2025 | Operators & Expression: Arithmetic, Relational, Logical, Bitwise, Unary, Assignment, Conditional Operators and Special Operators Operator Hierarchy;. Arithmetic Expressions, Evaluation of Arithmetic Expression,  Type Casting and Conversion. Decision making with if statement, if-else statement, nested if statement, else-if ladder, switch and break statement, goto statement, Looping Statements: for, while, and do-while loop, jumps in loops. |
| Oct.2025 | Arrays: One Dimensional arrays - Declaration, Initialization and Memory representation; Two Dimensional arrays -Declaration, Initialization and Memory representation.  Functions: definition, prototype, function call, passing arguments to a function: call by value; call by reference, recursive functions.  Strings: Declaration and Initialization, String I/O, Array of Strings, String Manipulation Functions: String Length, Copy, Compare, Concatenate etc., Search for a Substring. |
| Nov. 2025 | Pointers in C: Declaring and initializing pointers, accessing address and value of variables using pointers; Pointers and Arrays.  User defined data types: Structures - Definition, Advantages of Structure, declaring structure variables, accessing structure members, Structure members initialization, Array of Structures; Unions - Union definition; difference between Structure and Union. |