**NAME OF THE FACULTY: Ms. Esha Bansal**

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| **DATE** | **BCA-1st**  BCA23-CC203  Concepts of Operating Systems | **BCA-1st**  B23-SEC-201  Cloud Computing Skills | **BCA-1st**  BCA23-M201  Advanced Discrete Structure |
| **Jan 2025** | Introductory Concepts: Operating System, Functions and Characteristics, Historical Evolution of Operating Systems, Operating System Structure. Types of Operating System: Real time, Multiprogramming, Multiprocessing, Batch processing. | Basic Concepts of Cloud Computing Computer Network Basics. | Introduction, Basic Logical Operations, Proposition and Truth tables. |
| **Feb 2025** | Operating System Services, Operating System Interface, Service System Calls, System Programs. Process Management : Process Concepts, Operations on Processes, Process States and Process Control Block. InterProcess Communication CPU Scheduling: Scheduling Criteria, Levels of Scheduling, Scheduling Algorithms, Multiple Processor Scheduling, Algorithm Evaluation. | Concepts of Distributed Systems. Concepts of Cloud Computing and its Necessity. Cloud Service Providers in use and their Significance. | Tautologies and Contradictions, Logical equivalence, algebra of propositions. |
| **March 2025** | Deadlocks: Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery.  Memory Management Strategies: Memory Management of Single-User and Multiuser Operating System, Partitioning, Swapping, Contiguous Memory Allocation, Paging and Segmentation; | Cloud Infrastructure Cloud Pros and Cons. Cloud Delivery Models. Cloud Deployment Models.  Cloud Storage Management Concept of Virtualization and Load Balancing. | Set theory: Introduction, sets and elements |
| **April 2025** | Virtual Memory Management: Demand Paging, Page Replacement Algorithms, Thrashing. Implementing File System: File System Structure, File System Implantation, file operations, Type of Files, Directory Implementation, Allocation Methods, and Free Space Management. Disk Scheduling algorithm- SSTF, Scan, C- Scan, Look, C-Look.SSD Management. | Overview on Virtualization used for Enterprise Solutions. Key Challenges in managing Information. Identifying the problems of scale and management in big data.  Building Cloud Networks Designing and Implementing a Data Center-Based Cloud Installing | universal set and empty set, subsets, venn diagrams |
| **May 2025** | Synchronization: Critical Section Problem, Semaphores, Classical Problem of Synchronization, Monitors. | Open Source Cloud service. Amazon Web Services (AWS). Google Cloud Platform. | set operations. |

**NAME OF THE FACULTY: Ms. Priyanka**

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| **DATE** | **CLASS:**  **B.C.A. 2nd Semester**  **SUBJECT:**  **OOPC++**  **BCA23-CC201** | **CLASS: B.C.A 4th Sem.**  **SUBJECT:Front-End Development**  **BCA23-CC402** | **CLASS:**  **B.C.A 2nd Sem**  **SUBJECT: Advanced Discrete Structure**  **BCA23-M201** |
| **Jan 2025** | Basic concept of OOP, Comparison of procedural and OOP, Benefits of OOP, C++ compilation, Difference b/w C and C++, Elements of C++ Language- Tokens and identifiers: Character set and symbols, Keyword. | Objects in JavaScript: Introduction to objects, Types of objects in java script, creating objects | Boolean algebra: introduction, Basic Definitions, Duality |
| **Feb 2025** | C++ identifiers, Data types in C++, Operators, types of operators in C++. Precedence and associatively of operators.  Function: prototype, function call, definition, passing arguments, inline function, function overloading.  Object oriented features of C++: class and objects, data hiding & encapsulation, abstraction, data members and member functions, Accessing class members, empty class, local class, global class | Object methods, constructor function, prototype in javascript, inheritance using prototype chain  Regular expressions: introduction to regexp, regular expression uses, modifiers, patterns, methods, string methods, type conversion in java script  Event handling: java script events, event handler, event flow, event bubbling and capturing | Basic theorems, Boolean algebras as lattices, Representation theorem, |
| **March 2025** | scope resolution operator and its uses, static data members, static member functions, structure vs class, friend function and friend class.  Constructors and Destructors: constructors. Instantiation of objects, Default constructor, Parameterized constructor, copy constructor, destructors  OperatorOverloading:overloading unary operators | Event listeners, event types  Document object model: introduction, types, standards and methods, manipulating documents using DOM, handling images, table manipulation, animation, node and node list handling  Browse object model: Introduction, DOM vs BOM, window object methods, BOM navigator, BOM history | Sum of products form for sets, sum of products form for Boolean algebra |
| **April 2025** | Binary operators: arithmetic operators, manipulation of string using operators. Inheritance: Derived class, base class, accessing the base class member, Inheritance: multilevel, multiple, hierarchical, hybrid  Virtual base class, abstract class, virtual functions. Pure virtual function: polymorphism and its types | BOM location, BOM timer, introduction to cookies, session, persistence cookies  Form Handling: Introduction, Processing, object, validation, accessing data from forms, additional features, validation APIs | Relations: introduction, types of relations, equivalence relations, partial order relations, ordered set, Hasse diagram of partial ordered set |
| **May 2025** | Exception handling in c++: exception handling model, exception handling constructs- try, throw, catch, order of catch block, catching all exceptions | Jquery: introduction to jquery: jquery syntax, selectors, events, effects, html, traversing, AJAX and jquery misc. | Minimal and maximal, first and last elements. |

**Course:** BCA 4th semester

**Subject:** Data Structures and Applications

**Faculty Name:** Mr. Ashish Kumar

**Subject Code:** BCA23-CC401

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| **Month** | **Syllabus** |
| 16th Jan onwards, 2025 | 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). |
| Feb. 2025 | Arrays: Introduction, Linear Arrays, Representation of Linear Array in Memory, Two Dimensional and Multidimensional Arrays, Sparse Matrix and its Representation. String Handling: Storage of Strings, Operations on Strings viz., Length, Concatenation, Substring, Insertion, Deletion, Replacement, Pattern Matching. |
| March.2025 | 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. Stack: Array Representation of Stack, Linked List Representation of Stack, Algorithms for Push and Pop. |
| April 2025 | Application of Stack: Polish Notation, Postfix Evaluation Algorithms, Infix to Postfix Conversion, Infix to Prefix Conversion, Recursion. Introduction to Queues: Simple Queue, Double Ended Queue, Circular Queue, Priority Queue, Representation of Queues as Linked List and Array, Applications of Queue. Tree: Definitions and Concepts, Representation of Binary Tree, Binary Tree Traversal (Inorder. postorder, preorder) |
| May2024 | Binary Search Trees - Definition, Operations viz., searching, insertions and deletion, Searching and Sorting Techniques, Sorting Techniques: Bubble sort, Quick sort. Insertion Sort. Scarching Techniques: Sequential Scarching, Binary Searching. |

**Course:** B.Sc. 1st semester

**Subject:** Problem solving through C

**Faculty Name:** Mr. Ashish Kumar

**Subject Code:** B23-CC-C2

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| **Month** | **Syllabus** |
| 16th Jan onwards, 2025 | Overview of C: History, Importance, Structure of C Program, Character Set, Constants and Variables, Identifiers and Keywords, Data Types, Assignment Statement, Symbolic Constant. |
| Feb. 2025 | Input/output: Formatted I/O Function-, Input Functions viz. scanf(), getch(), getche(), getchar(), gets(), output functions viz. printf(), putch(). putchar(), puts().Operators & Expression: Arithmetic, Relational, Logical, Bitwise, Unary, Assignment, Conditional Operators and Special Operators Operator Hierarchy,. |
| March.2025 | 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, go to statement, Looping Statements: for, while, and do-while loop, jumps in loops. Arrays: One Dimensional arrays Declaration, Initialization and Memory representation: Two Dimensional arrays-Declaration. |
| April 2025 | 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, String Manipulation Functions: String Length, Copy, Compare, Concatenate etc. User defined data types: Structures Definition, Advantages of Structure, declaring structure variables. |
| May2024 | Accessing structure members, Structure member's initialization. Array of Structures; Unions-Union definition; difference between Structure and Union, |

**Course:** B.Com 1st semester

**Subject:** Basic IT tools

**Faculty Name:** Mr. Ashish Kumar

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

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| **Month** | **Syllabus** |
| 16th Jan onwards, 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. |
| Feb. 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. |
| March.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. |
| April 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. |
| May2024 | Social Networking: Facebook, Twitter, LinkedIn, Instagram, Instant Messaging (WhatsApp, Facebook Messenger, Telegram), Introduction to Blogs, Digital Locker. |

**NAME OF THE FACULTY: DR. MONIKA**

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| Month | CLASS: BSC III& BA III  SUBJECT: RELATIONAL DATA BASE SYSTEM | CLASS: BCA II  SUBJECT: Web Designing |
| Jan-Feb | Relational Model Concepts, Codd's Rules for Relational Model, Hierarchical Data Model– Introduction, Features, Components, Example, Network Data Model– Introduction, Features, Components, Example, Differences between Hierarchical Data Model and Network Data Model  Comparison of Relational Data Model with Hierarchical Data Model and Network Data Model | Creating a Website and Introduction to Mark up Languages (HTML and DHTML), HTML Document Features& Fundamentals, HTML Elements, Creating Links; Headers; Text styles; Text Structuring; Text color and Background; Formatting text; , Ordered and Unordered lists; |
| March | Relational Algebra:-Selection and Projection, Set operation, Join and Division  Relational Data Model:-Brief History, Terminology in Relational Data Structure, Relations,  Properties of Relations ER Diagrams of any Database  Keys – Primary, Secondary, Composite, Candidate, Alternate and  Foreign Key, Domains, Integrity Constraints over Relations.  SQL: Data Definition and data types, Create Table, Insert Data, Viewing Data, Filtering Table ,Sorting data | Introduction to Internet and  World Wide Web (WWW); Evolution and History of World Wide Web, Web Pages and Contents, Web Browsers; Searching, Search Engines and Search Tools.  Planning and designing website; Web Graphics Design, Steps For Developing website,  Page layouts, Images;  Inserting Graphics; Table Creation and Layouts; |
| April | Functional Dependencies and Normalization -- Purpose, Data Redundancy, Update Anomalies, Partial/Fully Functional Dependencies, Transitive Functional Dependencies, Characteristics of Functional Dependencies, Decomposition and Normal Forms (1NF, 2NF, 3NF & BCNF). | Frame Creation and Layouts; Working with Forms and Menus; Working with Radio Buttons; Check Boxes; Text Boxes, HTML5  UNIT-III  Introduction to CSS (Cascading Style Sheets): Features, Core Syntax, Types, Style Sheets and HTML, Style Rule Cascading and Inheritance, Text Properties, CSS Box Model, Normal Flow Box Layout, Positioning and other useful Style Properties; Features of CSS3. |
| May | PL/SQL-Introduction, Advantages of PL/SQL  The Generic PL/SQL Block: PL/SQL  PL/SQL Character Set and Data Types, Declaration and Assignment of Variables  Control Structure in PL/SQL: Conditional Control, Iterative Control, Sequential Control | Hypertext Transfer Protocol, URLs; Searching, Search Engines and Search Tools. Web Publishing: Hosting website; Internet Service Provider;  The Nature of JavaScript: Evolution of Scripting Languages, JavaScript-Definition, Programming for Non-Programmers, Introduction to Client–Side Programming, Enhancing HTML Documents with JavaScript. Static and Dynamic web pages. |

**NAME OF THE FACULTY: Dr. HIMANSHU GARG**

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| **DATE** | **CLASS:**  **B.C.A. 4th Semester**  **SUBJECT:**  **Computer Graphics**  **BCA23-CC403** | **CLASS: B.Com 1st Sem.**  **SUBJECT:Basic IT Tools SEC**  **B23-SEC-103** | **CLASS:**  **B.Sc. CS 6th Sem & BA 6th Sem**  **SUBJECT: Computer Network**  **Paper II** |
| **Jan 2025** | Introduction: History of CG, Applications of CG, Components of Interactive Graphics Systems | Introduction to Computer: Computer and Latest IT gadgets, Evolution of Computers & its applications | Introduction to Data Communication and Computer Networks; Uses of Computer Networks; Types of Computer Networks and their Topologies; |
| **Feb 2025** | Display Devices  Graphic Software  Input/Output Devices  Tablets | 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, | 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; |
| **March 2025** | Output Primitives  Line Drawing Algorithms  Circle Drawing Algorithms  Parametric Representation of Cubic Curves, Bezier Curves | 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), | 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; Data Link Layer Design issues; Error Detection and Correction methods; |
| **April 2025** | 2 D Transformations  Composite Transformations  Line Clipping Algorithms  Text Clipping | 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 | 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; Routing Algorithms: Flooding, Shortest Path Routing, Distance Vector Routing; Link State Routing, Hierarchical Routing; |
| **May 2025** | 3 D Graphics  3 D Transformations  Hidden Surface Eliminations  Shading | 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. | 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; |

**NAME OF THE FACULTY: Dr. Sonal Jain**

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| **DATE** | **CLASS:**  **B.C.A. 4th Semester**  **SUBJECT:**  **Modeling for OOP**  **BCA23-M401** | **CLASS: B.Sc L.Sc. + P.Sc**  **SUBJECT: Basic IT Tools SEC**  **B23-SEC-103** |
| **Jan 2025** | Fractional View: Use Case Diagram, Requirement Capture with Use case, Building blocks of use case diagram- actors. Use case guidelines for use case models. | Introduction to Computer: Computer and Latest IT gadgets, Evolution of Computers & its applications |
| **Feb 2025** | Relationship b/w use case – extend, include and generalization.  Activity diagram: elements of activity diagram- action state, activity state, object,node, control and object flow  Transition (fork,merge,join ), Guidelines for creating activity diagram.  Static view: classes, values and attributes, operations and methods. | 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, |
| **March 2025** | Responsibilities for abstract classes, access specifier, relationships among classes: associations, dependencies, inheritance, generalization, aggregation, adornment on association: association name, association classes, qualified association, n-ary associations, ternary and reflexive association, dependency relationship among classes notation. | 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), |
| **April 2025** | Dynamic view: state diagram notations, events (single event, change event, time events)  States: composite states, parallel states, transition and condition  State diagram behavior (activity effect, do activity, entry and exit activity.  Interaction diagram: Sequence diagram, notations, iterations, conditional messaging, branching, object creation and destruction, time constraints, origin of links | 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 |
| **May 2025** | Activations in sequence diagram, collaboration diagram- notations, iterations, conditional messaging and branching. | 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. |

**NAME OF THE FACULTY: Ms. Jyoti**

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| **DATE** | **CLASS:**  **B.Sc (PS) 4th Sem**  **SUBJECT:**  **OOPC++**  **B23-CC-C4** | **CLASS: B.Sc (PS) VOC 4th Sem**  **SUBJECT: Spreadsheet Tools B23-CC-M4** | **CLASS: B.A Geo(H) & Eng (H)- 2nd sem**  **SUBJECT: Basic IT Tools SEC**  **B23-SEC-103** |
| **Jan 2025** | Basic concept of OOP, Comparison of procedural and OOP, Benefits of OOP, C++ compilation, Difference b/w C and C++, Elements of C++ Language- Tokens and identifiers: Character set and symbols, Keyword. | Data Processing: Basic of data processing, spell check, removing duplicate rows, finding and replacing text. | Introduction to Computer: Computer and Latest IT gadgets, Evolution of Computers & its applications |
| **Feb 2025** | C++ identifiers, Data types in C++, Operators, types of operators in C++. Precedence and associatively of operators.  Function: prototype, function call, definition, passing arguments, inline function, function overloading.  Object oriented features of C++: class and objects, data hiding & encapsulation, abstraction, data members and member functions, Accessing class members, empty class, local class, global class | Changing the case of text, removing rows and columns from table, fixing number and number signs, fixing date and time. Merging and splitting columns, merging and splitting rows, transforming and rearranging columns and rows, reconciling table data by joining or matching. | 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, |
| **March 2025** | scope resolution operator and its uses, static data members, static member functions, structure vs class, friend function and friend class.  Constructors and Destructors: constructors. Instantiation of objects, Default constructor, Parameterized constructor, copy constructor, destructors  OperatorOverloading:overloading unary operators | Sort and filter operation: formula and function, solving generic problems through formula, mathematical function , statistical function, text function, logical function, compatibility function, information function, cube function, date and time function, web function. | 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), |
| **April 2025** | Binary operators: arithmetic operators, manipulation of string using operators. Inheritance: Derived class, base class, accessing the base class member, Inheritance: multilevel, multiple, hierarchical, hybrid  Virtual base class, abstract class, virtual functions. Pure virtual function: polymorphism and its types | Application of function, applying in built function, defining user function, modules, add in and automation function, lookup condition, lookup and reference function, conditional formatting, pivot chart and pivot table: data aggregation, representing data visually, calculating margins and other common ratio, filter data using slicer, data virtualization. | 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 |
| **May 2025** | Exception handling in c++: exception handling model, exception handling constructs- try, throw, catch, order of catch block, catching all exceptions |  | 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. |