

# **Object Oriented Programming Using C++**

## **(BCA): C-201**

**UNIT-I:** Introduction: Introducing Object Oriented Approach. Basic concept of OOPS, operators, tokens, variables, Keywords, Data types, identifiers, characters, typedef statement, constants, Enumerated data type.

**UNIT-II:** Control Flow: If statement, If Else statement, Nested if, Else, Statements, For Loop, While Loop, Do. Classes and Objects, Encapsulation, information hiding, abstract data types, attributes, methods, C++ class declaration, Constructors and destructors, Default parameter value, object types, dynamic memory allocation.

**UNIT-III:** Array: Array Illustration, Multi- Dimensional arrays, Strings, Array of Strings, Function prototype, function return data type, Default argument, Inline function, Function Overloading. Operator Overloading,

**UNIT-IV:** Pointers: Pointer to Derived Class, array of Pointers, Inheritance and Polymorphism: Inheritance, Class hierarchy, derivation, public, private & protected, abstract Classes.

**UNIT-V:** Files and Exception Handling: Streams and files, Namespaces.

# **Digital Electronics**

## **(BCA): C-202**

**UNIT-I:** Number System & Boolean Algebra: Number System: Binary, Octal, Decimal, Hexadecimal, Conversion of Number System, Binary Arithmetic & Complement, Boolean Function, Boolean Postulates, De-Morgan's Theorem, Boolean Expressions: Sum of Product, Product of Sum, Minimization of Boolean Expressions using K-Map, Logic Gates: AND, OR, NOT, NAND, NOR, XOR, XNOR.

**UNIT-II:** Combinational Circuits: Adders & Subtractors: Half Adder, Full Adder, Binary Adder, Half Subtractor, Full Subtractor, Magnitude Comparator: Two Bit Magnitude Comparator, Three Bit Magnitude Comparator, Multiplexer & De-Multiplexer.

**UNIT-III:** Sequential Circuit: Introduction to Flip Flops: SR, JK, Master Slave Flip Flops, Conversion of Flip Flops, Characteristic Table & Equation, Excitation Table, State Diagram, State Table, State Reduction.

**UNIT-IV:** Registers: Introduction of Registers, Classification of Registers, Register with Parallel Load, Shift Registers.

**UNIT-V:** Counters: Introduction of Counter, Asynchronous/Ripple Counters, Synchronous Counters, Ring Counter, Johnson Counter.

# **Data Structure Using 'C'/'C++'**

## **(BCA): C-203**

**UNIT-I:** Classification of Data Structure, Operations on Data Structure, Address Calculation, Application of arrays, Application of Arrays.

**UNIT-II:** Continuous Implementation (Stack): Array Representation, Operations on Stacks: Push & Pop, Applications of stack, Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack Recursion: Recursive Definition and Processes Recursion Vs. Iteration Continuous Implementation (Queue): Array representation and implementation of Queues.

**UNIT-III:** Non Continuous Implementation: Link Lists: Linear List concept, Linked List Terminology, Representation of Linked List in Memory, Types of Linked List, Single Linked List, Doubly Linked List, Operations on Link List: Create List Insert node (empty list, beginning, middle, end), Delete node (first, general case), Print list, Count Nodes, Sort Lists.

**UNIT-IV:** Trees: Introduction to Tree & its Terminology, Binary trees, Types of Binary trees, Representation of Binary Tree, Traversals (Inorder, Preorder, Postorder), Tree Expression.

**UNIT-V:** Sorting & Searching Techniques: Bubble Sort, Insertion Sort, Quick Sort, Sequential Search, Binary Search.

# **Principles of Management**

**(BCA): C-204**

**UNIT-I:** Nature of Management: Meaning, Definition, it's nature purpose, importance & Functions, Concepts of management, Administration, Organization, Evolution of Management.

**UNIT-II:** Functions of Management: Planning - Meaning - Need & Importance, type's levels, advantages & limitations. Forecasting - Need & Techniques Decision making Types.

**UNIT-III:** Elements of organizing & processes: Types of organizations, Delegation of authority Need, difficulties in delegation - Decentralization Staffing - Meaning & Importance Direction, Types & Importance. Leadership - Meaning-styles, qualities & functions of leaders

**UNIT-IV:** Functions of Management: Controlling Need, Nature, importance, Process & Techniques Coordination -Need- Importance, Strategic Management Definition, Classes of Decisions, Levels of Decision, Strategy, Role of different Strategist

**UNIT-V:** Recent Trends in Management: Social Responsibility of Management environment friendly management, Stress Management International Management

## **Numerical Methods**

**(BCA): C-205**

**UNIT-I:** Roots of Equations: Bisections Method, Newton's Raphson Method, Rate of convergence of Newton's method.

**UNIT-II:** Interpolation and Extrapolation: Finite Differences, The operator E-Newton's Forward and Backward Differences, Newton's dividend differences formula, Lagrange's Interpolation formula for unequal intervals, Laplace, Everett formula.

**UNIT-III:** Numerical Differentiation Numerical Integration: Introduction, direct methods, maxima and minima of a tabulated function, Trapezoidal rule, Simpson's One third rule.

**UNIT-IV:** Solution of Linear Equation: Gauss's Elimination method.

**UNIT-V:** Solution of Differential Equations: Euler's method, Fourth-order Ranga Kutta method.