**TEACHING PLAN**

**(July- November 2025)**

**Name: Ms Bhawna Kaushik**

**Department: Computer science**

**Subject: Problem Solving Techniques**

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| Month |  |
| July | Problems And Problem Instances, Generalization and Special Cases, Types of ComputationalProblems, Classification of Problems, Analysis of Problems, Solution Approaches, AlgorithmDevelopment, Analysis of Algorithm, Efficiency, Correctness, Role of Data Structures inProblem Solving, Problem-Solving Steps (Understand the Problem, Plan, Execute, AndReview), Breaking the Problem into Subproblems, Input/Output Specification, Input Validation,Pre and Post Conditions. |
| August | Structured Programming Concepts: Sequence (Input/Output/Assignment), Selection (If, If-Else)And Repetition (For, While, Do-While) Statements, Control Structure Stacking and Nesting.Different Kinds of Repetitions: Entry Controlled, Exit Controlled, Counter Controlled, Definite,Indefinite and Sentinel-Controlled Repetitions. Pseudocode and Flowcharts. Definition AndCharacteristics of Algorithms, Standard Algorithm Format. Problems Involving Iteration andNesting: Displaying Different Patterns and Shapes Using Symbols and Numbers, GeneratingArithmetic and Geometric Progression, Fibonacci and Other Sequences, Approximate ValuesFor π, Sin(x), Cos(x), Etc. Using Taylor Series. Different Kinds of Data in The Real World and How They are Represented in The Computer Memory. Representation of Integers: SignedMagnitude Form, 1’s Complement And 2’s Complement. Representation of Real Numbers:IEEE 754 Floating Point Representation. Representation of Characters: ASCII, UNICODE.  |
| September  | C Language: Introduction To Programming Languages, Different Generations of ProgrammingLanguages. Typed Vs Typeless Programming Languages, History of C Language, An Empty CProgram. C Language Counterparts For Input (scanf()), Output (printf()) Statements,Assignment, Arithmetic, Relational and Logical Operators. If, If-Else Statements, For, While,Do-While Statements. Data Types. Translating Pseudocode/Algorithm to C Program. Incremental Compilation and Testing of The C Program. Simple Problems Involving Input,Output, Assignment Statement, Selection and Repetition. Good Coding Practices. |
| October | Problems on Numbers: Extracting Digits of a Number (Left to Right and Right to Left),Palindrome, Prime Number, Prime Factors, Amicable Number, Perfect Number, ArmstrongNumber, Factorial, Converting Number from One Base to Another. Statistics (Maximum,Minimum, Sum and Average) on a Sequence of Numbers which are Read using SentinelControlled Repetition using only a few Variables.C Language: else-if Ladder, switch Case, Increment/Decrement Operators, break and continue Statements. |
| November  | Modular Programming, Top-Down and Bottom-Up Approaches to Problem Solving. Recursion.Problems on Arrays: Reading and Writing of Array Elements, Maximum, Minimum, Sum,Average, Median and Mode. Sequential And Binary Search. Any one Sorting Algorithm. Matrix Operations.C Language: Function Definition and Declaration (Prototype), Role of Return Statement, OneDimensional and Two-Dimensional Arrays. String Functions. Other Operators, OperatorPrecedence and Associativity. Debugging. |

**TEACHING PLAN**

**(July- November 2025)**

**Name: Ms Bhawna Kaushik**

**Department: Computer science**

**Subject: Object-Oriented Programming using C++**

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| Month |  |
| July |  Introduction to OOP concepts: Procedural Vs. Object- Oriented Programming, Principles of OOP and their benefits. Object, classes, Inheritance, Abstraction, Encapsulation Polymorphism, Dynamic Binding, Message passing. |
| August | C++ Programming Basics: Syntax and structure of C++ programs, Data types, variables, and constants inC++, Control structures: decision making and looping constructs |
| September  | Classes and objects: Defining and using classes and objects, Member functions and data members, Access specifiers: public, private, protected, Functions and parameter passing in C++, Arrays and strings in C++,Pointer, Constructors and destructors.Inheritance: Derived class and Base class, Types of inheritance: single, multiple, multilevel, hierarchical,Access control in inheritance. |
| October |  Polymorphism: function overloading, Operator overloading, Virtual functions and dynamic polymorphism,Abstract classes and pure virtual functions, Encapsulation and data hiding, Friend functions, static function.Memory Management: Dynamic Memory Allocation: new, delete, Object Creation at run time. |
| November  |  Exception handling: Throwing, Catching, Re-throwing an exception, specifying exception: processing unexpected exceptions; try-catch blocks, Exception propagation, Templates: class and function templates,Standard Template Library: benefits of STL and generic programmingWorking with Files: Stream Classes, File input and output Operations in C++, Error handling during file operations. |