CS 101

PROGRAMMING IN C & C++

UNIT-I

Introduction of Computers : Components, Block diagram, Operating Systems, Programming Languages, Assembler, Interpreter, Compiler, Loader, Linkers. Number Systems (Binary, Octal), Decimal and Hexal), Representation of numbers (fixed and floating point), Problem Solving : Algorithm, Flow Charts.

Basics of C: Structure of a C Program, Variables, Identifiers, Keywords, Data Types and Sizes, Constants, Declarations, Assignment & Intilization,

Operators & Expressions, Precedence and Order of Evaluation, Type Conversions.

Input and Output: Non- Formatted input & output, Formatted input & output.

Control Statements : Specifying Test Condition for Selection & Iteration, Conditional Execution & Selection, Iteration & Repetitive Execution, Goto Statement, SpecialControl Statements, Nested Loops.

UNIT-II

Arrays : One-Dimensional Array- Declaration, Initilization, Accessing Array Elements, Multi-Dimensional Array-Declaration, Initilization Unsized Array Initilization, Accessing Multi-Dimensional Arrays, Linear Search and Binary Search, Selection and Bubble Sort.

Functions : Concept of Function, Using Functions, Parameter Passing techniques, Passing Arrays to Functions, Scope & Extent, Storage Classes, Recursion.

C Preprocessor: #include, #define, #if, conditional compliliation.

Pointers : Pointers and Addresses, Address Operator, Declaring a Pointer, Initilizing the Pointer, Pointer Deferencing, Void Pointer, Null Pointer. Pointer

and Function Arguments, Pointer Arithmetic, Arrays & Pointers, Pointers to Pointers, Implementing Multi Dimensional arrays using pointers, Command line arguments.

UNIT-III

Structures and Unions : Basics, Structure and functions, arrays of structures, Pointers to Structures, Self Referential Structure, Union and Enumeration Types.

Files : Basics and File Handling functions : Copy file and display file text Files.

UNIT-IV

C++ : Introduction, simple program, standard library, header files, inline functions, references and reference parameters, default arguments, empty parameter lists, unary, scope resolution operator, function overloading.

Classes and data abstraction : Class scope, accessing class members, constructors, destructors , constant objects and member functions, this pointer, new and delete operators, Static Data Members and Member Functions.

C++ Operator overloading : Fundamentals, restrictions, overloading unary / binary operators, overloading ++ and --- Operators.

UNIT-V

C++ Inheritance : Base and derived classes, casting base class, pointers to derived class pointers, overriding, member functions, public, protected and private inheritance, constructors and destructors in derived classes.

C++ Virtual Functions : Abstract base class, polymorphism, dynamic binding, virtual destructors.

C++ Stream Input/Output : Streams, stream output, stream input.

C++ Templates : Introduction, class templates, templates and inheritance, templates and static members.

C++ Exception Handling : Try, throw, catch.

Suggested Reading :

1. Pradip Dey, Manas Ghosh, *Programming in C, Second edition*, Oxford University Press, 2011.

2. Sourav Sahay, Object Oriented Programming with C++, *Second edition,* Oxford University Press, 2012.

3. Raja Raman, *Computer Programming in C*, PHI Learning, 2013.

4. Bhushan Trivedi, Programming with ansi C++, *Second edition*, Oxford University Press, 2012.

5. K.R. Venugopal & RaJkumar Buyya, Mastering in C++, Second Edition, McGraw Hill Education, 2013.

6. Harry H. Cheng, *C/C++ for Engineers and Scientists*, TMH 2010.