Course Title	Course Code	Credit Hours
Fundamentals of Programming-I	CS-118	1-1

Textbooks:

- Delores Etter, Jeanine Ingber, "Engineering Problem Solving with C++", Pearson Prentice Hall

Reference Books/Materials:

- Harvey M. Deitel, and Paul J. Deitel, "C++ How to Program", Pearson/Prentice Hall
- Bartosz Milewski, "C++ in Action: Industrial Strength Programming", Addison-Wesley
- Robert Lafore, "Object-Oriented Programming in C++", Galgotia Publications
- Cay Horstmann, and Timothy Budd, "Big C++", Wiley

Course Objectives:

The objective of this course is to equip students with comprehensive C++ programming skills, including system understanding, algorithm development, data handling, and object-oriented programming.

Course Outline:

- Computer systems, computer organization, computer memory, networking, applications of programming, and the evolution of programming languages and C++ history.
- C++ development environment, preprocessor directives, compilers, linkers, variables, comments, common C++ data types, C++ keywords, I/O streams, C-in and C-out commands, pseudocode, and flowcharts.
- Arithmetic operations (addition, subtraction, multiplication, division, modulus), rules of operator precedence, relational operators (equality, greater than, less than), and logical operators (and, or, not).
- Top-down algorithm development, transfer of control, basics of conditional control, if conditional statements, if-else double selection statements, nested control statements, while repetition statements, and increment and decrement operators.
- Counter-controlled repetition, for repetition statements, do-while repetition statements, switch multiple selection statements, and the usage of break and

continue commands.

- Developments of Program components in C++, including function prototypes, function scope, signatures and arguments, storage classes, pass-by-value, pass-by-reference, and recursive functions.
- Declaration of arrays, one-dimensional arrays, multi-dimensional arrays, passing arrays to functions, searching arrays with linear search, sorting arrays with insertion sort, bubble sort, and quick sort.
- Classes, objects, member functions, data members, constructors, destructors, destructors, defining a class with member functions, defining member functions with parameters, and initializing objects with constructors.
- Class scope, accessing class members, access functions, utility functions, default member-wise assignment, constant objects and member functions, friend functions and classes, and static class members.
- Programming with the string data type, finding characters in a string, files, and streams, creating, and updating a sequential file, and creating and updating a random-access file.