

COURSE CODE	COURSE TITLE	L	T	P	C
1154CS201	PROBLEM SOLVING USING C++	2	0	4	4

**A. Preamble:**

To master all techniques of software development in the C++ Programming Language and demonstrate these techniques by the solution of a variety of problems spanning the breadth of the language including C++

**B. Prerequisite Courses:**

Sl. No	Course Code	Course Name
1	1150CS201	Problem Solving using C

**C. Related Courses: NIL**

**D. Course Educational Objectives:**

Learners are exposed to

- Understand of the utility of object-oriented programming over procedure-oriented programming.
- Know the concept of code reusability to use third party code in the form of predefined classes to write their programs.
- Use the programs written by others and write the programs that can be used by others without exposing the source code, using package and interface concepts.
- Understand exception handling mechanism for handling exceptional situation that occur during run time.

**E. Course Outcomes:**

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's taxonomy)
CO1	Develop the programs in C++ using object-oriented concepts.	K3
CO2	Implement programs that relate to procedures and functions	K3
CO3	Illustrate the concept of streams for real world applications.	K3
CO4	Implementing Flow control in C++ program in an efficient manner.	K3
CO5	Demonstrate the concept of Arrays, Pointers and inheritance.	K3

**F. Correlation of COs with POs:**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	L	L	L		L										M
CO2	L	L	L	L	L			L						M	
CO3	L	L	L	L	L	L						L			
CO4	L	M	M	M	L			L						M	
CO5	L	M	M	M	L	L			L		L				M

## **G. Course Content:**

### **Unit I Introduction to Computers and C++ Programming L-6, P-12**

Introduction to C++: A Sample C++ Program, Programming Tip: Input and Output Syntax. Layout of a Simple C++ Program, Compiling and Running a C++ Program, Testing and Debugging, Kinds of Program Errors, Variables, Identifiers, Variable Declarations, Assignment Statements, Input and Output, Data Types, Operators and Expressions, More Assignment Statements, Branching and Loop Mechanisms.

### **Unit II Procedural Abstraction and Functions. L-6, P-12**

Top-Down Design, Predefined Functions, Using Predefined Functions, Type Changing Functions, Defined Functions, Function Definitions, Global Constants and Global Variables, Call-by-Value Formal Parameters Are Local Variables, Introduction to Overloading.

### **Unit III Functions and I/O Streams L-6, P-12**

Void-Functions, Definitions of void-Functions, Return-Statements in void-Functions, Call-by-Reference Parameters, Call-by-Reference, Using Procedural Abstraction, Functions Calling Functions, Preconditions and Post conditions. Streams and Basic File I/O, Streams and Basic File I/O, File I/O. Classes and Objects: Techniques for File I/O, Tools for Stream I/O, Formatting Output with Stream Functions, Streams as Arguments to Functions, Character I/O, Predefined Character Functions

### **Unit IV Classes, Abstract Data Types, Flow of Control L-6, P-12**

Structures, Structures as Function Arguments, Classes, Defining Classes and Member Functions, Public and Private Members, Abstract Data Types. Classes to Produce ADTs. Using Logical Expressions, Logical Expressions, Multiway Branches, Nested Statements, Multiway if-else-Statements, the switch-Statement, the for-Statement, the break-Statement, Defining ADT Operations, Friend Functions, Overloading Operators, Overloading Unary Operators, Overloading >> and <<.

### **Unit V Arrays, Strings, Pointers, Inheritance L-6, P- 12**

Introduction to Arrays - types of array, Declaring and Referencing Arrays, Arrays in Functions, Arrays and Classes, Arrays of Classes, String-String Input and Output, Recursion, Pointers-Pointer Variables, Pointers and Linked Lists. Inheritance- Programming with Inheritance, Virtual Functions

**Total: 90**

### **Text Book**

1. B. Trivedi, "Programming with ANSI C++", Oxford University Press, 2007.

### **Reference Books**

1. Ira Pohl, "Object Oriented Programming using C++", Pearson Education, Second Edition Reprint 2004.
  2. S. B. Lippman, Josee Lajoie, Barbara E. Moo, "C++ Primer", Fourth Edition, Pearson Education, 2005.
- B. Stroustrup, "The C++ Programming language", Third edition, Pearson Education, 2004