SWARNANDHRA
COLLEGE OF ENGINEEERING AND TECHNOLOGY
(AUTONOMOUS)

SEETHARAMPURAM, NARSAPUR-534280, WG- DT, AP

DEPARTMENT OF BACHELOR OF COMPUTER APPLICATIONS(Honours)

TEACHING PLAN

Course Code	Course Title	Year/ Sem.	Branch	Contact Hr/ week	Academic Year
24BC2L02	OOPS THROUGH C++ LAB	I/II	BCA	3	2024-25

Course Objectives:

- To strengthen their problem solving ability by applying the characteristics of an object oriented approach.
- To introduce object oriented concepts in C++ and Java

Course Outcomes (Cos): At the end of the course, student will able to

CO No	Course Outcome	Knowledge Level (K)
CO1	Understand and implement basic concepts of C++ such as input/output, variables, control flow, and expressions.	K2
CO2	Apply C++ programming concepts to implement functions, classes, object-oriented principles, and memory management.	K3
CO3	Analyze and implement advanced OOP features like inheritance, polymorphism, operator overloading, and templates.	K4
CO4	Develop solutions to problems using STL (Standard Template Library) and demonstrate exception handling mechanisms in C++	K3
CO5	Demonstrate the ability to use inheritance and polymorphism for code reuse and runtime behavior customization.	K4

S.No	Program	Proposed Number of Labs
1	**Exercise 1: (Basics)** Write a Simple Program on printing "Hello World" and "Hello Name" where name is the input from the user a) Convert any two programs that are written in C into C++. b) Write a description of using g++ (150 Words)	1
2	**Exercise 2: (Expressions Control Flow)** a) Write a Program that computes the simple interest and compound interest payable on principal amount (in Rs.) of loan borrowed by the customer from a bank for a given period of time (in years) at specific rate of interest. Further determine whether the bank will benefit by charging simple interest or compound interest. b) Write a Program to calculate the fare for the passenger starveling in a bus. When a Passenger enters the bus, the conductor asks "What distance will you travel?" On knowing distance from passenger (as an approximate integer), the conductor mentions the fare to the passenger according to following criteria.	1
3	**Exercise 3: (Variables, Scope, Allocation)** a) Write a program to implement call by value and call by reference using reference variable. b) Write a program to illustrate scope resolution, new and delete Operators. (Dynamic Memory Allocation) c) Write a program to illustrate Storage classes d) Write a program to illustrate Enumerations	1
4	**Exercise 4: (Functions)** Write a program illustrating Inline Functions a) Write a program illustrates function overloading. Write 2 overloading functions for power. b) Write a program illustrates the use of default arguments for simple interest function.	1

5	**Exercise 5: (Functions –Exercise Continue)** a) Write a program to illustrate function overloading. Write 2 overloading functions for adding two numbers b) Write a program illustrate function template for power of a number. c) Write a program to illustrate function template for swapping of two numbers..	1
6	**Exercise 6: (Classes Objects)** Create a Distance class with: i) feet and inches as data members ii) member function to input distance iii)member function to output distance Iv)member function to add two distance objects a) Write a main function to create objects of DISTANCE class. Input two distances and output the sum. b) Write a C++ Program to illustrate the use of Constructors and Destructors (use the above program.) c) Write a program for illustrating function overloading in adding the distance between objects (use the above problem). d) Write a C++ program demonstrating a Bank Account with necessary methods and variables	1
7	**Exercise 7: (Access)** Write a program for illustrating Access Specifiers public, private, protected a) Write a program implementing Friend Function b) Write a program to illustrate this pointer c) Write a Program to illustrate pointer to a class	1
8	**Exercise 8: (Operator Overloading)** a) Write a program to Overload Unary, and Binary Operators as Member Function, and Non - Member Function. i Unary operator as member function ii Binary operator as non member function b) Write a C ++ program to implement the overloading assignment = operator	1

9	**Exercise 9: (Inheritance)** a) Write C++ Programs and incorporating various forms of Inheritance b) Single Inheritance ii) Hierarchical Inheritance iii) Multiple Inheritances **Exercise 10: (Inheritance –Continued)** a) Write C++ Programs and incorporating various forms of Inheritance i. Multi-level inheritance ii) Hybrid inheritance b) Write a program to show Virtual Base Class	1
10	**Exercise 11: (Inheritance –Continued)** a) Write a Program in C++ to illustrate the order of execution of constructors and destructors in inheritance b) Write a Program to show how constructors are invoked in derived class. **Exercise 12: (Polymorphism)** a) Write a program to illustrate runtime polymorphism b) Write a program to illustrate this pointer c) Write a program illustrates pure virtual function and calculate the area of different shapes by using abstract class.	1
11	**Exercise 13: (Templates)** a) Write a C++ Program to illustrate template class b) Write a Program to illustrate class templates with multiple parameters c) Write a Program to illustrate member function templates **Exercise 14: (Exception Handling)** a) Write a Program for Exception Handling Divide by zero b) Write a Program to rethrow an Exception	1
12	**Exercise 15: (STL)** a) Write a Program to implement List and List Operations b) Write a Program to implement Vector and Vector Operations	1

References:

1. https://eecs.wsu.edu/~nroy/courses/cpts122/labs/
2. https://www.coursera.org/learn/c-plus-plus-a
3. https://www.educative.io/courses/learn-object-oriented-programming-in-cpp
4. https://www.udemy.com/course/fundamentals-of-object-oriented-programing- cplusplus/

Faculty

Head of the Department

Principal