SCTR'S PUNE INSTITUTE OF COMPUTER TECHNOLOGY, PUNE-43
First Year B. Tech. Curriculum Structure
With effect from the A.Y. 2024-25

OBJECT ORIENTED PROGRAMMING USING C++ LAB (OOPCL)

COURSE DETAILS		EVALUATION SCHEME	
COURSE CODE	F016	TW	25 M
PRACTICAL HRS. / WK	02		
CREDITS	01		

PREREQUISITES

C Programming for Problem Solving Lab

COURSE OBJECTIVES

1. Learn and use the basic programming constructs of C++
2. Understand built-in and derived C++ data types,
3. Apply object-oriented concepts to solve problems using C++
4. Use file handling and exception handling in C++

COURSE OUTCOMES

After completion of this course, student shall be able to:

F016-1: Implement a class using encapsulation, constructors and destructor.

F016-2: Implement different types of inheritance using C++.

F016-3: Implement functions and polymorphism in C++ for given problem.

F016-4: Apply exception handling and file handling in C++

LIST OF ASSIGNMENTS

GROUP(A) (ANY 5

1. Write a program to take input of student details (roll no, name and branch) and display it.
2. Write a menu driven program to calculate the area of circle, rectangle and triangle.
3. Write a program that reads a group of members from the user and places them in an array of type float. Once the numbers are stored in the array, the program should average them and print the result. Use pointer notation wherever possible.
4. Imagine a publishing company that markets both book and audiocassette versions of its works. Create a class **publication** that stores the title (a string) a price (type float) of a publication. From this class derive two classes: **book**, which adds a page count (type int) and **tape**, which adds a playing time in minutes (type float). Each of these three classes should have a get data () function to get its data from the user at the keyboard, and a put data () function to display its data.
5. Make a class named Fruit with a data member to calculate the number of fruits in a basket. Create two other classes named Apples and Mangoes to calculate the number of apples and mangoes in the basket. Print the number of fruits of each type and the total number of fruits in the basket.
6. Write a program to find Area of and Volume of 3D objects using Multiple inheritance.

GROUP(B) (ANY 5)

1. Write program to find the sum of squares of first n natural numbers using function without parameter but with return type.
2. Write a program to swap different types of values using function overloading so that changes made in formal parameter should be reflected in actual parameter.
3. Write a program to overload unary operators (++, --) for a complex number.
4. Write a program to overload binary operators (<<, >>) for accepting and displaying complex numbers.
5. Write a program to implement run time polymorphism to calculate areas of different polygons.
6. Create a class employee. Save employees information by using default constructor, parameterized constructor, copy constructor. Handle exceptions if a user enters invalid data e.g. negative age.

GROUP(C)

1. Write a program with the following:

a. A function to read two double type numbers from the keyboard.
b. A function to calculate the division of these two numbers.
c. A try block to throw an exception when a wrong type of data is keyed in.
d. A try block to detect and throw an exception if the condition "divide-by-zero" occurs.
e. Appropriate catch block to handle the exceptions thrown.

2. Write a program to open a student.txt file, read data and also update data from this file by using file pointers.
3. Two files named "Sorce1" and "Source2" contain a sorted list of integers. Write a program that reads the contents of both the files and stores the merged list in sorted form in a new file named "Target".

SUGGESTED LEARNING RESOURCES (TEXT / REFERENCE BOOKS)

1. "Object Oriented programming in C++ "by Raajesh K. Shukla Wiley INDIA edition
2. "Object Oriented programming in C++ "by Robert Lafore, 3rd edition

"Object Oriented programming with C++ "by E Balagurusamy , 8th edition

WEB LINKS AND VIDEO LECTURES (E-RESOURCES)

1. https://ntedu.top/wp-content/uploads/2018/11/Programming-And-Problem-Solving-With- C-Comprehensive-6th-Edition.pdf
2. https://chenweixiang.github.io/docs/The_C++_Programming_Language_4th_Edition_Bjarne_Stroustrup.pdf

ACTIVITY BASED LEARNING (SUGGESTED ACTIVITIES IN CLASS)

1. Mock Test
2. Gamification
3. Online Interactive Tool
4. Collaborative and Individual Problem based learning.

Quizzes/Assignment