



# SILVER OAK UNIVERSITY

## College Computer Application

Integrated M.Sc(IT)

Subject Name: Object Oriented Programming with C++

Subject Code: 1040235104

Semester: 2<sup>nd</sup>

**Prerequisite:** Knowledge of the C programming language

**Objective:** : The object oriented approach for software development has become the de-facto standard for the industry to develop the product based or customized software based on customer demand. The software libraries developed for various fields also follows the phenomena of object oriented development. The subject covers the basic concepts of the object oriented paradigm and popular object oriented programming language C++. The subject covers the basics of C++, objects and classes, Inheritance, Polymorphism, I/O and file management, and advance topics including templates, exceptions and STL (Standard Template Library).

### Teaching and Examination Scheme:

Teaching Scheme			Credits C	Evaluation Scheme				Total Marks
L	T	P		Internal		External		
				Th	Pr	Th	Pr	
4	0	4	6	40	20	60	30	150

### Content:

Unit No.	Course Contents	Teaching Hours	Weightage %
1	<b>Concepts of OOP :</b> Introduction OOP, Procedural Vs. Object Oriented Programming, Principles of OOP, Benefits and applications of OOP	4	8
2	<b>C++ Basics :</b> Overview, Program structure, namespace, identifiers, variables, constants, enum, operators, typecasting, control structures	6	10
3	<b>C++ Functions :</b> Simple functions, Call and Return by reference, Inline functions, Macro Vs. Inline functions, Overloading of functions, default arguments, friend functions, virtual functions	6	12
4	<b>Objects and Classes :</b> Basics of object and class in C++, Private and public members, static data and function members, constructors and their types, destructors, operator overloading, type conversion	8	15
5	<b>Inheritance :</b> Concept of Inheritance, types of inheritance: single, multiple, multilevel, hierarchical, hybrid, protected members, overriding,	8	15

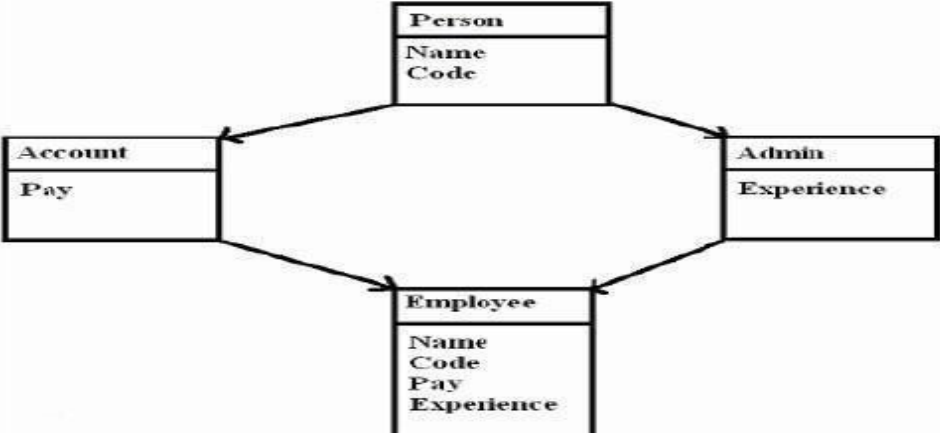
	virtual base class		
6	<b>Polymorphism :</b> Pointers in C++, Pointers and Objects, this pointer, virtual and pure virtual functions, Implementing polymorphism	6	10
7	<b>I/O and File Management :</b> Concept of streams, cin and cout objects, C++ stream classes, Unformatted and formatted I/O, manipulators, File stream, C++ File stream classes, File management functions, File modes, Binary and random Files	8	15
8	<b>Templates, Exceptions and STL :</b> What is template? function templates and class templates, Introduction to exception, try-catchthrow, multiple catch, catch all, rethrowing exception, implementing 8 15% user defined exceptions, Overview and use of Standard Template Library	8	15

### Course Outcome:

Sr. No.	CO statement	Unit No
CO-1	Understand Object oriented programming principles and benefits.	1
CO-2	Demonstrate how to define and use classes, methods, objects how to override and overload methods, compile and execute programs.	2, 3, 4
CO-3	Write an application using inheritance, Polymorphism.	5, 6
CO-4	Write an application using I/O and File Management.	7
CO-5	Understand Templates and Exception Handling and STL.	8

### List of Experiments/Tutorials:

Sr No.	Practical Aim
1.	Write a program to print "Hello World".
2.	Write a program to make a Calculator .(Using Switch Case)
3.	Write a program to print sum of series 1+3+5+ ...+N using function.(For Looping, Condition, Function)
4.	Write a program to implement arithmetic operations using Inline function.
5.	Function in C++ A. WAP for function with default arguments. B. WAP to illustrate the concept of call by value and call by reference.
6.	Write a program to implement function overloading and returns volume of cube, cylinder, and Rectangular box.
7.	Write a program to find the mean value of given number using friend function.
8.	Write a program to declare a class BOX with length, width and height parameters. Assign the value and print the values for two object1 and object2(Outside and inside the class definition)
9.	Extend practical 6 and create an array of 3 objects B[3] to accept and display to details of the three box using methods.(For Array with in class and array of objects concepts)

10.	Write a program for creating constructor and destructor of the class Date with 3 parameters dd,mm,yy. Initialize 2 objects D1, D2 with 12-02-2013 and 15-04-1989 values with parameterized constructor.
11.	Write a program to implement concept of Copy Constructor.
12.	Write a program to add two numbers using operator overloading.(Using Unary and binary operator overloading )
13.	Write a program to concept of Function Overriding.
14.	<p>Consider a class network as shown in figure given below. The class Employee derives information from both Account and Admin classes which in turn derive information from the class Person. Define all the four classes and write a program to create, update and display the information contained in Employee objects.</p>  <pre> classDiagram     class Person {         Name         Code     }     class Account {         Pay     }     class Admin {         Experience     }     class Employee {         Name         Code         Pay         Experience     }     Person &lt; -- Account     Person &lt; -- Admin     Account &lt; -- Employee     Admin &lt; -- Employee </pre>
15.	Write a program with two class Base and Derived. Each with method void display().Show the use of virtual function to access Derived class's method.( For virtual function)
16.	Write a program to read / write whole object of class STUDENT with roll number, name and marks of 3 students from files.(For File Handling)
17.	Write a program to Exception handling for Divide by Zero Exception.
18.	Write a program to demonstrate use of Template in C++ for a class STACK which accepts values of stack in either int, float or character depending upon the template variable T.(For Template)

### Major Equipment:

Computer, Laptop

### Books Recommended:-

Object Oriented Programming With C++, E Balagurusamy, TMH

2. C++ Programming, Black Book, Steven Holzner, dreamtech

3. Object Oriented Programming in Turbo C++, Robert Lafore, Galgotia

4. Object Oriented Programming with ANSI and Turbo C++, Ashok Kamthane, Pearson

5. The Complete Reference C++, Herbert Schilitz, TMH