



## **C.U.SHAH UNIVERSITY – Wadhwan City**

**FACULTY OF:** Technology and Engineering (Diploma Engineering)

**DEPARTMENT OF:** Computer Engineering

**SEMESTER:** -IV **CODE:** - 2TE04OOP1

**NAME –** Object Oriented Programming with C++

### **Teaching & Evaluation Scheme:-**

Subject Code	Name of the Subject	Teaching Scheme				Evaluation Scheme							
		Th	Tu	Pr	Total	Theory				Practical (Marks)			Total
						Sessional Exam		University Exam		Internal		University	
						Marks	Hours	Marks	Hours	Pr/Viva	TW	Pr	
<u>2TE04OOP1</u>	<b>Object Oriented Programming with C++</b>	04	00	04	08	30	1.5	70	03	30	20	----	150

### **Objectives:-**

Object Oriented Programming knowledge is much important in field of software engineering. C++ is such a dynamic language that is helpful for developing real-time applications such as business software as well as system software such as compiler, editor etc.

**Prerequisites:** -Basic knowledge of C Programming.

### **Course Outlines:-**

Sr. No.	Course Contents	Hours
1	<b>Principles of Object Oriented Programming</b> Procedure – oriented programming, Object oriented programming paradigm, Basic concepts of object oriented Programming, Benefits of object oriented programming, Application of object oriented programming, What is C++?, Application of C++, Input/output operators, Structure of C++ program	4
2	<b>Tokens, Expressions and Control Statements</b> Tokens, Keywords, identifiers, basic data types, user- defined types, derived data types, symbolic constants, type compatibility, declaration of variables, dynamic initialization of variables, reference variables, Operators in C++ (Scope resolution operator, member referencing operator, memory management operator, manipulators, type cast operator) Expression (Expression and their types, special assignment operator, implicit conversions, operator precedence), Control structures (Conditional control structure: Simple if, if...else, nested if else, switch etc.), Looping Statements (for, while, do...while)	5

3	<b>Functions in C++</b> The main function, Function prototype, Call by reference, Return by reference, Inline function, Default arguments, Const arguments, Functions overloading	5
4	<b>Classes and Objects</b> C structures revisited, Specifying a class, Local Classes, Nested Classes, Defining member functions, nesting of Member functions, private member function, making outside function inline, Arrays within a class, Memory allocation for objects, Static data member, Static member functions, Arrays of objects, Objects as function arguments, Friendly functions, Returning objects, Const member function, Pointer to members	7
5	<b>Constructor and Destructor</b> Characteristics of constructor, Explicit constructor, Parameterized constructor, Multiple constructor in a class, Constructor with default argument, Copy constructor, Dynamic initialization of objects, Constructing two dimensional array, Dynamic constructor, Destructors	6
6	<b>Operator Overloading and Type Conversion</b> Concept of operator overloading, Over loading unary and binary operators, Overloading of operators using friend Function, Manipulation of string using operators, Rules for operator overloading, Type conversions, Comparison of different method of conversion	5
7	<b>Inheritance</b> Defining derived classes, Types of inheritance (Single, Multiple, Multi-level, Hierarchical, Hybrid), Virtual base class & Abstract class, Constructors in derived class, Application of Constructor and Destructor in Inheritance	5
8	<b>Pointer, Virtual Functions and Polymorphism</b> Pointer to Object, Pointer to derived class, this pointer, Rules for virtual function, Virtual function and pure virtual function, Default argument to virtual function	4
9	<b>Console I/O Operations</b> C++ streams, C++ stream classes, Unformatted and formatted I/O operations, Use of manipulators.	3
10	<b>Working with Files</b> File stream classes, Opening and closing a file, Error handling, File modes, File pointers, Sequential I/O operations, Updating a file (Random access), Command line arguments	4

### List of Experiments

- Write a program to print maximum from 2 numbers.
- Write a program to check whether a number is even or odd.
- Write a program to print percentage of 3 subjects and display grade of student.
- Write a program to find maximum of 5 numbers using array.
- Write a program to sort 5 numbers using array.
- Write a program to print values of local and global variables using scope resolution operator.
- Write a program using call-by reference function.
- Write a program using inline functions
- Write a program using default argument function.
- Write a program to demonstrate class and objects.
- Write a program using array of objects.
- Write a program to with a function to add objects of a class.
- Write simple program to show the use of constructors and destructor.

- Write a program to demonstrate constructor overloading.
- Write a program to demonstrate hierarchical inheritance concept
- Write a program to demonstrate multiple inheritance.
- Write a program using pointer to object.
- Write a program to print a name pattern using write () function. (Unformatted I/O).
- Write a program to print output using various functions such as width (), precision (), fill (). (Formatted I/O).

### **Learning Outcomes:-**

The syllabus topics should be taught and implemented with the aim to develop different types of skills leading to the achievement of the following competencies

- Basic concepts of OOP
- Classes and objects Fundamentals

### **Books Recommended:-**

- Object Oriented Programming in C++ - **by E. Balagurusamy** (Tata McGraw Hill Publications)
- The Complete Reference C++ - **by Schildt** (Tata McGraw-Hill Publications)
- Mastering C++ - **by Venugopal** (Tata McGraw-Hill Publications)

### **E- References:-**

- [www.cplusplus.com](http://www.cplusplus.com)
- [www.learncpp.com](http://www.learncpp.com)