Faculty of Engineering & Technology
Diploma Engineering (DE)
(W. E. F.: 2023-24)

Document ID: SUTEFETD-01

2Name of Faculty	:	Faculty of Engineering & Technology
Name of Program	:	Diploma Engineering (DE)
Course Code	:	2DIT02
Course Title	:	Object Oriented Programming
Type of Course	:	Basic Engineering (BE)
Year of Introduction	:	2023-24

Prerequisite	:	Programming for Problem Solving using C++
Course Objective	:	Introduces Object Oriented Programming concepts using the C++ language, Introduces the principles of data abstraction, inheritance and polymorphism, Introduces the principles of virtual functions and polymorphism, Introduces handling formatted I/O and unformatted I/O, Introduces exception handling
Course Outcomes	:	At the end of this course, students will be able to:
	CO1	Students will understand the need of object oriented programming, fundamental concepts and will be able to solve computational problems using basic constructs like if-else, control structures, array, strings.
	CO2	Students will be able to implement relationships between classes.
	CO3	Demonstrate the use of various data structures like array, file and structure.
	CO4	Applying the concepts of top-down modular programing to decompose problem and a program solution into smaller pieces and Analyse how length of the source program can be reduced by using functions.
	CO5	Evaluate how pointers are effective in handling arrays, functions and data tables and how pointers support Dynamic memory management.
	CO6	Develop C++ Programs using various methods described above to solve real-world problems.

Teaching and Examination Scheme

Teaching Scheme (Contact Hours)			Credits	Examination Marks				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	SEE	CIA	SEE	CIA	
3	0	2	4	70	30	30	20	150

Legends: ***L****-Lecture;* ***T****–Tutorial/Teacher Guided Theory Practice;* ***P*** *– Practical,* ***C*** *– Credit,* ***SEE*** *– Semester End Examination,* ***CIA*** *- Continuous Internal Assessment (It consists of Assignments/Seminars/Presentations/MCQ Tests, etc.))*

Course Content

Unit No.	Topics	Teaching Hours	Weightage	Mapping with CO
1	**Introduction of Object Oriented Programming :** Procedure oriented Programming, Object oriented programming paradigm, Basic concepts of Object Oriented Programming, Advantages of Object Oriented Programming, Object Oriented Languages, Applications of Object Oriented Programming++ Concepts ,Structure of C++ program, Applications of C++,Basic Data types in C++ , User defined Data types , Derived Data types, Defining Constants ,Declaration of variables and Dynamic initialization of variables, Reference variables, Operators in C++ , Scope Resolution Operators, Member dereferencing Operators, Memory Management Operators and Manipulators , Type cast Operator	5	20%	CO1
2	**Functions in C++ and Working with objects:** The Main Function, Function prototyping, Call by Reference and Return by Reference, Inline functions, Default Arguments, Constant Arguments, Function Overloading, Classes and Objects : Overview of C structure, Defining Class and Creating Objects , Memory Allocation for Objects, Defining Member function, Making an outside function Inline , Nesting of Member functions, Private Member functions, Arrays within a Class, Static Data member and Static Member functions, Array of Objects, Passing Objects as an Argument, Returning Object, Friend function, Pointer to members	12	12%	CO2, CO3, CO4, CO6
3	**Introduction of Constructor and Destructor :** Constructor Concepts, Destructor, Parameterized Constructor, Multiple Constructors in a Class, Constructor with Default Arguments, Copy Constructor, Dynamic Constructor,	7	13%	CO1, CO5, CO6
4	**Introduction of Inheritance :** Concepts of Inheritance, Defining Derived Classes, Single Inheritance ,Making a Private Member Inherited ,Multiple Inheritance, Multilevel Inheritance, Hybrid Inheritance , Virtual Base Class, Abstract Classes, Constructor in Derived Classes	8	20%	CO5, CO6
5	**Introduction of Pointers, Virtual functions and polymorphism :**	8	15%	

	Pointers to objects, Develop programs using pointers to objects, 'this' Pointer, Pointer to Derived Classes, Virtual Functions, Pointer to virtual Functions,			CO5,CO6
6	**Introduction of Managing Console I/O Operations :** Input and Output Streams, C++ Stream Classes, Unformatted and formatted I/O Operations, Formatting with Manipulators	5	20%	CO3,CO6

Suggested Distribution of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyse	Evaluate	Create
Weightage	**20**	**30**	**30**	**20**	**0**	**0**

NOTE: This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Suggested List of Experiments/Tutorials

Sr. No.	Name of Experiment/Tutorial	Teaching Hours
1	Experiment to minimum 5 programs using control structures	2
2	Experiment to minimum 2 programs using arrays	2
3	Experiment to programs using reference variable, scope resolution operator, simple manipulators, and number data type	4
4	Experiment to call by reference and return by reference, default arguments, constant arguments, and function overloading	6
5	Experiment to minimum 5 different classes such as student, distance, shape, employee, feet, time, data etc. with data member & member functions. Also Develop programs to test those classes functionality.	4
6	Experiment to Apply the concepts of constructors and destructors in the programs developed in unit-2 and test those programs.	4
7	Experiment to programs using single, multilevel, multiple inheritance.	4
8	Experiment to programs using inheritance and constructors.	2
9	Experiment to programs using pointer to derived classes	2
10	Experiment to programs using unformatted and formatted i/o functions	4

Major Equipment/ Instruments and Software Required

Sr. No.	Name of Major Equipment/ Instruments and Software
1	Dev-C++
2	Code::Blocks

Suggested Learning Websites

Sr. No.	Name of Website
1	www.tutorials4u.com

2	C++ Fundamentals:http://www.oupinheonline.com
3	C++ Tutorials: http://www.tutorialspoint.com/cplusplus/cpp_overview.htm
4	Complete C++: http://www.cplusplus.com
5	Learn C++ Programming: http://www.learncpp.com

Reference Books

Sr. No.	Name of Reference Books
1	Head First C by David Griffiths & Dawn Griffiths.
2	Object Oriented Programming With C++, Ashok N. Methane, Pearson
3	Object Oriented Programming with C++, E. Balagurusamy, TMH
4	Object Oriented Programming with C++ - second edition, Sahay Sourav, Oxford, Delhi 2012