

COURSE TITLE	OBJECT ORIENTED DESIGN AND PROGRAMMING
COURSE CODE	01AI0103
COURSE CREDITS	5

Objective:

- 1 The objective of the course is to enable graduates to identify and practice the object-oriented programming concepts and techniques. This course covers practical usage of C++ classes and class libraries, modify existing C++ classes, and develop C++ classes for simple applications.
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Course Outcomes: After completion of this course, student will be able to:

- 1 Identify the potential benefits of object-oriented programming features and compare them with structure-oriented programming features. (understand)
- 2 Apply various object-oriented Features and Concepts to designing programs and to solve various computing problems using C++ language. (apply)
- 3 Analyze programs based on exception handling and using advanced features like STL for faster development. (analysis)
- 4 Apply Different concepts of object-oriented programming to develop real-world applications. (Apply)

Pre-requisite of course: Programming Fundamentals

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
4	0	2	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	Introduction Introduction to Object Oriented Programming, procedural Vs. Object Oriented Programming, Principles of OOP, Access Modifiers, Basics of a Typical C++ Environment, Pre-processors Directives, , C++ Program structure, Header Files and Namespaces, library files	6
2	Programming Basics Output using cout, Directives, Input with cin, Type bool, The setw manipulator, Type conversions	7
3	Functions Call and Return by reference, Overloaded function, Macro Vs. Inline functions, Default arguments, friend functions	6

Contents : Unit	Topics	Contact Hours
4	Object and Classes Introduction, Structure Definitions, Accessing Members of Structures, Class Scope and Accessing Class Members, Initializing Class Objects: constructors and their types, destructors	5
5	Operator overloading Overloading unary operations, Overloading binary operators, data conversion, pitfalls of operators overloading and Type conversion	8
6	Inheritance Concept of inheritance. Derived class and based class, Derived class constructors, member function, class hierarchies, public and private inheritance	2
7	Polymorphism Pointers in C++, Objects and Pointers, virtual and pure virtual functions, this pointer, Pointers in C++, Objects and Pointers, virtual and pure virtual functions, this pointer, Implementing run time polymorphism	2
8	Streams and Files Concept of streams, C++ stream classes, formatted and Unformatted I/O, File stream, manipulators, C++ File stream classes, File modes, File management functions, Binary Files, random Files	3
9	Templates & Exception Handling What is template? Function templates and class templates, Overloading Template Functions, Inheritance and Templates, Templates and Friend functions, Overview and use of Standard Template Library, try-catch throw, Multiple catch, catch all, Re-throwing Exception	3
Total Hours		42

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	Experiment 1 Learning and implementing basic OOPC concepts related programs	2
2	Experiment 2 Programs related to practice the usage of functions	2
3	Experiment 3 Programs to learn and implement C++ Classes	2
4	Experiment 4 Programs to implement Inheritance and test with main class.	2
5	Experiment 5 Demonstrate Runtime Polymorphism by defining media class as Base class and Book and Tape as Sub Class. Keep display () function such that, It provides run time polymorphism.	2
6	Experiment 6 Create and maintain a File through a C++ program	2

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
7	Experiment 7 Experiments related to Standard Template Library	2
8	Experiment 8 Write a function templates for finding the minimum value contained in an array.	2
9	Experiment 9 Write a class template to represent a generic vector.	2
10	Experiment 10 A table gives a list of car models and the number of units sold in each type in a specified period. Write a program to store this table in suitable container and to display interactively the total value of a particular model sold, given the unit-cost of that model.	2
Total Hours		20

Textbook :

- 1 Object Oriented Programming in Turbo C++, Robert Lafore, The WAITE Group Press, -

References:

- 1 Object Object oriented Programming with C++ by E Balagurusamy, Object Object oriented Programming with C++ by E Balagurusamy, E Balagurusamy, Tata McGraw Hill , 2001
- 2 C++ Programming, Black Book, C++ Programming, Black Book, Steven Holzner, dreamtech, -
- 3 Object Oriented Programming in Turbo C++ by Robert Lafore, Object Oriented Programming in Turbo C++ by Robert Lafore, Robert Lafore, The WAITE Group Press, -
- 4 Compete Reference C++, Compete Reference C++, Herbert Schlitz, Tata McGraw Hil, -

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery					
Remember / Knowledge	Understand	Apply	Analyze	Evaluate	Higher order Thinking / Creative
0.00	20.00	60.00	0.00	0.00	20.00

Instructional Method:

- 1 The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, MOOCs etc.
- 2 The internal evaluation will be done on the basis of continuous evaluation of students in the laboratory and class-room.

Instructional Method:

- 3 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.
- 4 Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.

Supplementary Resources:

- 1 www.nptel.ac.in
- 2 www.learncpp.com