MCA106:Object Oriented Programming Concepts	
Teaching Scheme Lectures: 3 hrs/Week Tutorials: 1 hr/Week Credits: 4	**Examination Scheme** Unit Test -12Marks Teachers Assessment - 6Marks Attendance – 12 Marks End Semester Exam – 70 marks

Prerequisite: -

1. Computer Fundamentals
2. Principles of computer programming
3. Basic mathematical formulas.

Course Objectives:

1. Be able to write a C++ program to solve a well specified problem.
2. Understand a C++ program written by someone else.
3. Be able to debug and test C++ programs;
4. To make the students understand the features of object oriented principles.
5. Familiarize them with virtual functions, templates and exception handling.
6. To make the students to develop applications using C++.

Detailed Syllabus

UNIT I (10 Hours) **Introduction to OOP:** Basic concepts of OOPs, Advantages of OOP, characteristics of object-oriented languages, Object, Classes, Encapsulation, Data Abstraction, Inheritance, Polymorphism, Dynamic binding, Message Passing, keywords, identifiers, data types, manipulators, **O**perators in C++, Operator Precedence, Typecast operator, Control structures, Loops.
UNIT II (6 Hours) **Functions:** Function Prototyping, Call by reference, Return by Reference, Default and Constant Arguments, Inline Function, functions Overloading, Friend and virtual Functions, static function.
UNIT III (10 Hours) **Objects and classes:** Specifying class & object, Arrays as class member data, Arrays of objects, Constructors and Destructors, objects as function arguments. **Operator Overloading: O**verloading Unary & Binary operators,
UNIT IV (10 Hours) **Inheritance: introduction, defining deriv**ed classes, overriding member functions, Single Inheritance, multilevel Inheritance, multiple Inheritance, Hierarchical Inheritance, Virtual Base Class. **Files and Streams:** Introduction, classes for file stream operations, opening and closing files, file pointers and their manipulations, Error Handling, command-line Arguments.
UNIT V (10 Hours) **Object Modeling:** Objects and classes, links and association, generalization and inheritance, aggregation, abstract class, multiple inheritance, Meta data, candidate keys, constraints. **Dynamic Modeling:** Events and states, operations, nested state diagrams and concurrency, advanced dynamic modeling concepts, a sample dynamic model.
UNIT VI (10 Hours) **Functional Modeling:** Data flow diagram, specifying operations, constraints, a sample functional model. OMT, examples and case studies to demonstrate methodologies, comparisons of methodologies, SA/SD, JSD.

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Text and Reference Books

1. Object Oriented Programming with C++, E. Balaguruswamy, 4th Edition.
2. Object Oriented Programming in C++, Robert Lafore, Sams, Dec., 2001.
3. C++ Programming, D. Ravichandran, TMH, 2nd Edition, Dec. 2002.
4. Mastering C++, Venugopal, TMH, September, 1997.

Course Outcomes:

1. Understanding the concept and recognize the basic terminology used in computer programming.
2. Students will be able to apply the computer programming techniques to solve practical problems.
3. Students will be able to understand the concepts and implementation of class , constructors and destructors.
4. Students are able to learn C++ data types, memory allocation/deallocations, functions and pointers
5. Use different data structures and create / manipulate basic data files and developing applications for real world problems.
6. Students are able to apply object oriented programming concepts to software problems in C++ Outcome(s)

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