CSH206: Programming in C++

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

Prerequisite: - Basics of c language

Course Objectives:

1. Understand fundamentals of object-oriented programming in C++.
2. Have the ability to write a computer program to solve specified problems.
3. Be able to explain the difference between object-oriented programming and procedural programming.
4. Be able to program using more advanced C++ features
5. Be able to build C++ classes using appropriate encapsulation and design principles.
6. Improve problem solving skills

Detailed Syllabus

UNIT I **Introduction to OOP:** Basic concepts of OOPs, Advantages of OOP, Need of object-oriented programming, characteristics of object-oriented languages, Object oriented approach vs procedure oriented approach, Object, Classes, Encapsulation, Data Abstraction, Inheritance, Polymorphism, Dynamic binding, Message Passing, Application of OOPs.
UNIT II **C++ Programming Basics:** Language Fundamentals-Character set, Keywords, Identifiers, Variables, Constant, Data Types, and Comments. Operators in C++, Operator Precedence - Types of operators, Precedence and Associativity. Type Conversion, Statement and types of statements. Difference between C++ and C. Basic program construction, input/output using cin/count; manipulators
UNIT III **Control Statements:** Conditional expressions, loop statements, breaking and control statements. Arrays-Notation, Declaration, Initialization, Processing.

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UNIT IV **Functions:** Simple functions, Function Prototyping, Call by reference, Return by Reference, Default Arguments, Constant Arguments, Inline Function, functions overloading, static function.
UNIT V **Classes and Objects:** Introduction, structure and classes, declaration of class, defining the object of a class, accessing a member of class, arrays of class objects, Constructors, Destructors, friend function, Dynamic memory allocation. Constructors and Destructors, objects as function arguments, static class member.
UNIT VI **Inheritance:** Introduction, defining derived classes, overriding member functions, Single Inheritance, multilevel Inheritance, multiple Inheritance, Hierarchical Inheritance, Virtual Base Class. Operator Overloading: Overloading Unary & Binary operators, Data conversion.
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. 5. Object Oriented Programming using C++ , Joyce Farrell, Cengage Learning India Pvt. Ltd., 6th Edition.

Course Outcomes:

After completing the course, students will be able to:

1. Describe the procedural and object-oriented paradigm with concepts of streams, classes, functions, data and objects.
2. Understand dynamic memory management techniques using pointers, constructors, destructors, etc.
3. Describe the concept of function overloading, operator overloading, virtual functions and polymorphism.
4. Implement abstraction level programming using inheritance
5. Design modular programs.
6. Apply good programming style and understand the impact of style on developing and maintaining programs.
7. Design object-oriented solutions for small systems involving multiple objects.

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