# C++ PROGRAMMING

SUMMARY:

This course provides experienced C Language programmers with the skill to create object oriented programs using the C++ programming language. The student will learn the syntax of the language, as well as how to code and execute object oriented C++ programs.

AUDIENCE:
Technical Users, Applications Programmers, and Systems Programmers.

PREREQUISITES:
Completion of the Programming in C Language course or a working knowledge of the C Programming Language. Knowledge of one of the program editors for the development environment used for the exercise sessions. An understanding of object oriented programming concepts would also prove helpful.

DURATION:
Five (5) days including classroom lecture and lab sessions.

OBJECTIVES:
Upon successful completion of this course, the student will be able to:

- Distinguish new C++ Language features not available in C Language.
- Compile and execute C++ programs.
- Define encapsulation, inheritance, and polymorphism.
- Use inline functions and function overloading.
- Create data abstractions through the use of classes.
- Share and restrict object members.
- Define and use constructors and destructors.
- Dynamically create and destroy space.
- Use the I/O Stream related classes.
- Use operator overloading.
- Declare and use named constants.
- Describe scope, storage class, and linkage.
- Increase software reusability through inheritance.
- Use dynamic binding and virtual functions.
- Declare and use class and function templates (Optional)



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COURSE CONTENT:

I. INTRODUCTION
- A. Features of C++
- B. History and Origin of C++
- C. Advantages of C++
- D. C++ Compilation Process

II. C++ vs. C
- A. Compatibility between C and C++
- B. Comments and Readability
- C. C++ Keywords and Modifiers
- D. Variable Declarations in C++
- E. Derived Data Types
- F. Operator Precedence and Associativity
- G. Scope/Global Operator (::)
- H. Namespaces
- I. Input/Output Streams

III. FUNCTIONS
- A. Function Definition
- B. Function Declaration
- C. Reference Parameters
- D. Default Argument Values
- E. Function Overloading
- F. Inline Functions
- G. Type Safe Linkage
- H. Name Mangling
- I. Combining C and C++ Functions

IV. OBJECT ORIENTED CONCEPTS
- A. Features of Object Oriented Languages
- B. Procedural vs. Object Oriented
- C. Data Abstraction
- D. Encapsulation
- E. Inheritance
- F. Polymorphism
- G. Effects of OO Approach
- H. Basic OO Design (CRC Cards)

V. CLASSES AND ENCAPSULATION
- A. Definition of Class
- B. Class Syntax
- C. Class Data Members
- D. Class Member Functions
  1. Internal
  2. External
- E. Private vs. Public Members



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