springpeople

Design and Development using CPP – 4 days

Day-1

Module 1

Object based programming.

- C++ classes and structs
- Components of a class
- Classification of member functions
- Member Access Control
- Constructors
- loops and conditional statements
- Classes lacking default constructors
- Default constructor
- Constructor with parameters.
- Copy constructor
- Designing a String Class.
- Passing and returning objects by reference
- Constant member functions and data members
- Mutable members
- Initialization list.
- Explicit Constructors
- Non-Public Constructor
- Destructors
- Enums
- Pointers
- “this” Pointer
- Static Class Members
- Pointers to class Members
- delegating constructors
- rvalue references
- move constructors

Module 2

Object oriented programming

- Relationship between objects.
- Is a Relation
- Composition
- Visibility of Base members in the derived class

- Private inheritance
- Constructed and destructors
- Name hiding, using declaration
- Virtual Member Functions
- Pure Virtual Member Functions
- Inheritance of interface and inheritance of implementation.
- Covariant Return Types
- Interface classes
- vptr and vtable
- Runtime time information (typeid and dynamic cast)
- final and override

Day-2

Module 3

- Exception Handling
- Traditional Error Handling Methods
- Exception Handling Mechanism
- Exception leaving destructors
- Throwing Exceptions
- Ways by which an exception can be caught.
- Re-throwing
- Using smart pointers
- Exception Specification
- Function try Blocks.
- Standard Exceptions
- Uncaught exceptions, set_terminate()
- Declaring exception specifications (Polymorphic classes)
- noexcept

Module 4

- Generic programming (Templates)
- Declaration of a Class Template.
- Outlining class member functions
- Template parameter and argument list
- Template (type, value, template) parameters
- Default Type Arguments
- Static Data Members
- Friendship
- Complete specialization
- Partial Specialization
- Template compilation models
- Function templates

- Use of typename
- Instantiations of template functions
- Argument deduction
- Template Function Specialization
- explicit instantiation
- Member templates
- Inheritance of class templates
- extern templates
- alias templates

Day-3

Module 5

- Containers, vector
- Iterators, the iterator base class and iterator traits
- Associative Containers: Set, Map, List, Multiset, Multimap
- Iterators: input, output, forward, bi-directional & random iterators
- File Handling
- API development using c++
- Unit test using Google Test (GTest), Catch2, Boost.Test

Day 4

Module 6

Design Principle for Object Oriented Programming

- Need of design principles
- Relationships in OOPS
- Aggregation
- Association
- Composition
- Is a
- Has a
- Tight and loose coupling
- SOLID Design Principles

Module 7

Design Patterns to develop framework

- Creational Design Pattern,
- Structural design patterns,
- Behavioral design patterns.
- Sigleton
- Factory method
- Adaptor method

- Bridge method
- Decorator Design method