ANNEXURE - II

C++ Complete with C++11 -14-17-20

1. OBJECTIVES

- To enable the participants to develop good object-oriented design and use modern C++ effectively

2. Duration

- This is a 6 **Days** Program

3.Entry Profile

- Medium degree of proficiency in "C".
- Medium degree of proficiency in OO concepts

Day 1

Runtime memory layout of a application

- Code Segment
- Data Segment
- Heap
- Stack

Concepts of Object oriented

- The Object-oriented approach
- Abstraction, Encapsulation and Modularity
- Interface and implementation
- Fundamentals of Object Oriented Approach
- Why objects?
- Classes & Objects – the different perspectives
- State, Identity and Behavior
- Abstraction
- Encapsulation
- Inheritance & Class Hierarchy
- Polymorphism: Early v/s late binding
- Object relationships

Namespace

- What is a namespace?
- Using Namespace with Scope resolution
- Using Namespace with The using directive
- Using Namespace with The using declaration
- Namespace Aliases
- Namespace Composition

- Resolving Potential Clash

Day 2

Functions

- Inline function
- Function prototype
- Recursive Function
- Overloading Functions
- Pass by value v/s Pass by ref
- Default function Arguments
- Variable Parameter List
- Temporary objects

Class and Object concepts

- Classes and Objects
- Class declaration & object mechanism
- Objects & references
- Constructors and Destructors
- Overloaded constructors
- Copy constructor
- Destructors
- Managing the heap
- Objects & references
- Copy constructor
- Overloading copy constructor

Day 3

Data Members

- Memento Pattern

Function Pointers

- Callbacks using Function Pointer
- Synchronize v/s Asyncronize calls
- Observer Pattern

Container class

- Creating Container Class
- Iterator Pattern
- Composite Pattern
- Command Pattern

Object Attributes and Behaviour

- Static members and objects on the heap
- Static members of a class
- Static data members
- Static member functions
- Const data members
- Const member functions

Day 4

Friend Functions

- Friend and classes
- Object communication
- Friend functions
- Friend classes
- Const objects and const member functions
- Object composition & destruction mechanism

Operator Overloading

- Overloading unary & binary operators
- Overloading the input/output stream operators
- Operators that cannot be overloaded
- Conversion functions
- Returning objects & assignment operator
- Copy And Swap Idiom
- Overloading >> & << operators
- Cascading operators & returning reference

Day 5

Inference and Closures

- Type Inference
- Lambda Expressions

Dynamic Memory Management Techniques for Memory Management

- Preventing Heap based objects
- Identifying object is on Heap or Stack

- Smart pointers

Exception handling

- multiple catch blocks
- catch any block
- set_terminate functions
- custom exception class

Day 6

- Inheritance in private, protected & public mode
- Applying Inheritance, key abstraction and dynamic binding
- Constructors & destructors in a derived class
- Multiple inheritance
- Virtual Base class
- Invoking base class constructors
- Why a constructor is not inherited
- Is-a & Has-a relationship
- Nested classes & Containership
- Runtime Polymorphism, Virtual Functions & Dynamic Binding
- Pointers & Classes
- Pointers to Class Members