CS – 13
C++ and Object – Oriented Programming

Unit : 1
Principles of Object – Oriented Programming Tokens, Expressions & Control Statements

Procedure – Oriented Programming

- Object oriented programming paradigm
- Basic concepts of object-oriented Programming
- Benefits of object-oriented programming
- What is c++?
- Input/output operators
- Structure of c++ program
- Introduction of namespace
- Create own header file
- Tokens :
  Keywords, identifiers, basic data types, user- defined types, derived data types, declaration of variables, dynamic initialization of variables, reference variables
- Operators in C++ :
  Scope resolution operator, member referencing operator, memory management operator, manipulators, and type cast operator.
- Expression :
  Expression and their types, special assignment operator, implicit conversions
- Control structures
  Conditional control structure:
  Simple if, if…else, nested if else, switch etc.
  Looping control structure :
  for, while, do…while

Functions in C++

- The main function
- Function prototype
- Call by reference
- Return by reference
- Inline function
- Default arguments
- Functions overloading
- Adding C Functions turbo C++

Unit : 2
Classes and Objects, Constructor & Destructor

C structures revisited

- Specifying a class
- Local Classes
- Nested Classes

- Defining member functions, nesting of Member functions, private member function, making outside function inline
- Arrays within a class
- Memory allocation for objects
- Static data member
- Arrays of objects
- Objects as function arguments
- Friendly functions
- Returning objects
- Characteristics of constructor
- Explicit constructor
- Parameterized constructor
- Multiple constructor in a class
- Constructor with default argument
- Copy constructor
- Dynamic initialization of objects
- Dynamic constructor
- Destructors

Unit : 3

Operator Overloading & Type Conversion, Inheritance

- Concept of operator overloading
- Over loading unary and binary operators
- Overloading of operators using friend Function
- Manipulation of string using operators
- Rules for operator overloading
- Type conversions.
- Comparison of different method of conversion
- Defining derived classes
- Types of inheritance (Single, Multiple, Multi-level, Hierarchical, Hybrid)
- Virtual base class
- Constructors in derived class
- Containership, Inheritance V/s Containership

Unit : 4

Pointer, Virtual functions & Polymorphism, RTTI Console I/O Operations

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- Pointer to Object
- Pointer to derived class
- this pointer
- Rules for virtual function
- Virtual function and pure virtual function.
- Default argument to virtual function
- Run Time Type Identification

- C++ streams
- C++ stream classes
- Unformatted and formatted I/O operations
- Use of manipulators.

Unit : 5
Working with Files, Exception handling, Introduction to Template STL

- File stream classes
- Opening and closing a file
- File modes
- File pointers
- Sequential I/O operations
- Updating a file (Random access)
- Command line arguments
- Overview of Exception Handling
- Need for Exception Handling
- various components of exception handling
- Introduction to templates
- Class templates
- Function templates
- Member function templates
- Overloading of template function
- Non-type Template argument
- Primary and Partial Specialization
- Introduction to STL
- Overview of iterators, containers

	Class Room	Seminar	Expert Talk	Test	Total
No. Of Lecture	**60**	**05**	**05**	**05**	**75**

Reference Books:

1) Complete Reference C++ by Herbert Schildt McGraw Hill Publications
2) Computer Science- A Structured approach using C++ by Forouzan, Gilburg, THOMSON
3) Object Oriented Programming in C++ - E. Balagurusamy, BPB
4) Object Oriented programming in C++ by Robert Lafore, Pearson Education
5) Mastering C++ - Venugopal
6) The C++ Programming Language by Bjarne Stroustrup, Pearson Education
7) Object Oriented Programming in C++ - Robaret Laphore
8) Let us C++ - Yashvant Kanitkar, BPB

Reference Website

https://www.tutorialspoint.com/cplusplus/
https://www.javatpoint.com/cpp-tutorial
https://www.studytonight.com/cpp/
https://www.programiz.com/cpp-programming/examples