



**Object Oriented Concepts Through CPP**  
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**[CORE COURSE]**

**Semester: IV**

**Credits: 3**

**Subject Code: BC42102**

**Lectures: 48**

**Course Outcomes:**

At the end of this course, the learner will be able to,

- Acquire an understanding of basic object-oriented concepts and the issues involved in effective class design.
- Create programs using C++ features like operator overloading,
- Analyse and apply the concepts of constructor and destructor, inheritance, polymorphism and exception handling.

**Unit 1: Introduction to C++**

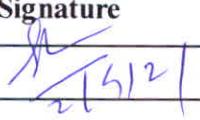
**16**

- Basic concepts, features, advantages and applications of OOP
- Introduction, applications and features of C++
- Input and Output operator in C++
- Simple C++ program
- Data type and Keywords
- Classes and objects
  - Structure and class, class, object.
  - Access specifier, defining data member.
  - Defining member function inside and outside the class.
  - Memory allocation for objects.
  - Static data member and member function.
  - Array of objects, objects as function arguments.
  - Friend function and friend class.
  - Function returning of objects.
- Declaration of variables, dynamic initialization of variables, reference variable
- Operators: Scope resolution operator
- Memory management operators
- Manipulators
- Functions:
- Function prototyping, call by reference and return by reference
- Inline functions
- Default arguments

**Unit 2: Constructors and Destructors**

**06**

- Constructors
- Types of constructor : Default, Parameterized, Copy

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- Multiple constructors in a class
- Constructors with default argument
- Dynamic initialization of constructor
- Dynamic constructor
- Destructor

### Unit 3 Inheritance and Polymorphism

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- Introduction
- Defining Base class and Derived class
- Types of Inheritance
- Virtual Base Class
- Abstract class
- Constructors in derived class
- Compile Time Polymorphism
- Introduction, rules for overloading operators
- Function overloading
- Operator Overloading unary and binary
- Operator Overloading using friend function
- Overloading insertion and extraction operators
- String manipulation using operator overloading
- Runtime Polymorphism
- this Pointer, pointers to objects, pointer to derived classes
- Virtual functions and pure virtual functions

### Unit 4: Managing console I/O operations and working with files and strings

12

- C++ streams and C++ stream classes
- Unformatted I/O operations
- Formatted console I/O operations
- Output formatting using manipulators
- User defined manipulators
- Stream Classes for File operations
- File operations - Opening, Closing and updating
- File updating with random access.
- Error handling during File operations
- Command Line arguments
- Manipulating strings
  - Introduction
  - Creating objects
  - Manipulating string objects
  - Relational operations
  - String characteristics
  - Accessing characters in strings
  - Comparing and swapping

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**#12 hours for Library work, assignments practical or field work**

**Recommended Text Books:**

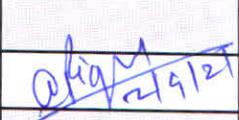
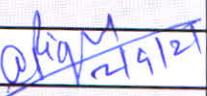
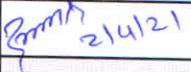
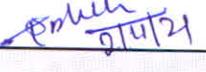
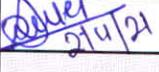
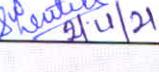
- EBalagurusamy, *Object Oriented programming with C++*

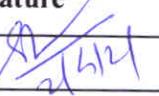
**Reference Books:**

- EBalaguruswamy, *Object Oriented programming with C++*.
- RobertLafore, *Object Oriented programming with C++*.
- Herbert Schildt, *The Complete Reference C++*

**Websites:**

<https://www.tutorialspoint.com/>  
[www.w3schools.com](http://www.w3schools.com)

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Subject Expert (Outside SPPU)	Prof Sachin Bohite	 21/4/21
VC Nominee	Prof Anjum Patel	 21/4/21
Industry Expert	Ms Shruti Wayal	 21/4/21
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