



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

<b>Semester: IV</b>	<b>Credits: 3</b>	<b>Subject Code: BC42102</b>	<b>Lectures: 48</b>
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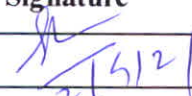
**Course Outcomes:**

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.

<b>Unit 1: Introduction to C++</b>	<b>16</b>
<ul style="list-style-type: none"><li>• Basic concepts, features, advantages and applications of OOP</li><li>• Introduction, applications and features of C++</li><li>• Input and Output operator in C++</li><li>• Simple C++ program</li><li>• Data type and Keywords</li><li>• Classes and objects<ul style="list-style-type: none"><li>○ Structure and class, class, object.</li><li>○ Access specifier, defining data member.</li><li>○ Defining member function inside and outside the class.</li><li>○ Memory allocation for objects.</li><li>○ Static data member and member function.</li><li>○ Array of objects, objects as function arguments.</li><li>○ Friend function and friend class.</li><li>○ Function returning of objects.</li></ul></li><li>• Declaration of variables, dynamic initialization of variables, reference variable</li><li>• Operators: Scope resolution operator</li><li>• Memory management operators</li><li>• Manipulators</li><li>• Functions:<ul style="list-style-type: none"><li>• Function prototyping, call by reference and return by reference</li><li>• Inline functions</li><li>• Default arguments</li></ul></li></ul>	

<b>Unit 2: Constructors and Destructors</b>	<b>06</b>
<ul style="list-style-type: none"><li>• Constructors</li><li>• Types of constructor : Default, Parameterized, Copy</li></ul>	

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<ul style="list-style-type: none"> <li>• Multiple constructors in a class</li> <li>• Constructors with default argument</li> <li>• Dynamic initialization of constructor</li> <li>• Dynamic constructor</li> <li>• Destructor</li> </ul>	
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<b>Unit 3 Inheritance and Polymorphism</b>	<b>14</b>
<ul style="list-style-type: none"> <li>• Introduction</li> <li>• Defining Base class and Derived class</li> <li>• Types of Inheritance</li> <li>• Virtual Base Class</li> <li>• Abstract class</li> <li>• Constructors in derived class</li> <li>• Compile Time Polymorphism</li> <li>• Introduction, rules for overloading operators</li> <li>• Function overloading</li> <li>• Operator Overloading unary and binary</li> <li>• Operator Overloading using friend function</li> <li>• Overloading insertion and extraction operators</li> <li>• String manipulation using operator overloading</li> <li>• Runtime Polymorphism</li> <li>• this Pointer, pointers to objects, pointer to derived classes</li> <li>• Virtual functions and pure virtual functions</li> </ul>	

<b>Unit 4: Managing console I/O operations and working with files and strings</b>	<b>12</b>
<ul style="list-style-type: none"> <li>• C++ streams and C++ stream classes</li> <li>• Unformatted I/O operations</li> <li>• Formatted console I/O operations</li> <li>• Output formatting using manipulators</li> <li>• User defined manipulators</li> <li>• Stream Classes for File operations</li> <li>• File operations - Opening, Closing and updating</li> <li>• File updating with random access.</li> <li>• Error handling during File operations</li> <li>• Command Line arguments</li> <li>• Manipulating strings             <ul style="list-style-type: none"> <li>○ Introduction</li> <li>○ Creating objects</li> <li>○ Manipulating string objects</li> <li>○ Relational operations</li> <li>○ String characteristics</li> <li>○ Accessing characters in strings</li> <li>○ Comparing and swapping</li> </ul> </li> </ul>	

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

**Recommended Text Books:**

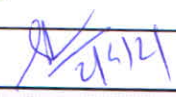
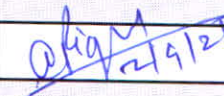
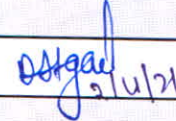
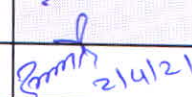
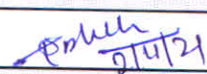
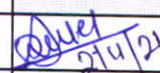

- EBalagurusamy, *Object Oriented programming with C++*

**Reference Books:**

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

**Websites:**

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

Board Of Studies	Name	Signature	
Head of the Department	Prof. Smita Borkar		
Faculty*	Prof Monika Rajguru		
Faculty*	Prof. Deepali Gupta		
Subject Expert (Outside SPPU)	Dr. Sagar Jambhorkar		
Subject Expert (Outside SPPU)	Prof Sachin Bohite		
VC Nominee	Prof Anjum Patel		
Industry Expert	Ms Shrutika Wayal		
One Alumni***	Ms. Vidhi Thakkar		

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