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| ***Name of The Course*** | **Object Oriented Programming** | | | | |
| ***Course Code*** | BCS01T1006 | | | | |
| ***Prerequisite*** | C Programmimg | | | | |
| ***Corequisite*** |  | | | | |
| ***Antirequisite*** |  | | | | |
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***Course Objectives:***

*The purpose of this course is to provide basic concepts of Object oriented programming with C++. The main goal of the course is to teach the students how to Apply the OOPS concepts in various applications that are appropriate for problems that they might encounter. This course is also to teach constructors, destructors, inheritances, polymorphism, virtual function and control structures. This also provides knowledge of input output stream functions.*

***Course Outcomes:***

After successful completion of the course, students will be able to:

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| **CO1** | Understand the Object Oriented Programming Features. |
| **CO2** | Analyze and Apply the role of constructors &destructors in program design. |
| **CO3** | Understand the concept of Exception Handling. |
| **CO4** | Apply the concept of inheritances, polymorphism and virtual function for problem solution |
| **CO5** | Apply the different input output streams for problem solution. |
| **CO6** | Understanding of latest advances and its applications in Computer Programming and Problem Solving. |

***Text Book (s)***

1. Object Oriented Programming with C++ - Rajiv Sahay, Oxford Mastering C++ - Venugopal, McGraw-Hill Education (India)
2. Herbert Schildt, C++ - The Complete Reference, Third Edition -Tata McGraw Hill - 1999.
3. Bruce Eckel, Thinking in C++, Second Edition, Volume One, Pearson Education Asia, 2000.

***Reference Book (s):***

1. Object Oriented Programming in C++ by Robert LaforeTechmedia Publication.
2. Object Oriented Programming in C++ SauravSahay Oxford University Press.
3. Object Oriented Programming in C++ R Rajaram New Age International Publishers 2nd.
4. OOPS C++ Big C++ Cay Horstmann Wiley Publication.
5. C++: The Complete Reference- Schildt, McGraw-Hill Education (India)
6. C++ and Object Oriented Programming – Jana, PHI Learning.

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| **Unit I: Introduction: Basic Terminology 4 lecture hours** |
| Object oriented programming concepts – objects – classes – methods and messages – abstraction and encapsulation – inheritance – abstract classes – polymorphism. Introduction to C++ – classes – access specifiers – function and data members – default arguments – function overloading – friend functions – const and volatile functions - static members – Objects – pointers and objects – constant objects – nested classes – local classes. |
| **Unit II: Constructor & Destructor 2 lecture hours** |
| Constructors – default constructor – Parameterized constructors – Constructor with dynamic allocation – copy constructor – destructors – operator overloading – overloading through friend functions – overloading the assignment operator – type conversion – explicit constructor. |
| **Unit III: Exception Handling 2 lecture hours** |
| Function and class templates - Exception handling – try-catch-throw paradigm – exception specification – terminate and unexpected functions – Uncaught exception. |
| **Unit IV: Inheritance 3 lecture hours** |
| Inheritance – public, private, and protected derivations – multiple inheritance - virtual base class – abstract class – composite objects Runtime polymorphism – virtual functions – pure virtual functions – RTTI – typeid – dynamic casting – RTTI and templates – cross casting – down casting |
| **Unit V: I/O STREAMS 2 lecture hours** |
| Streams and formatted I/O – I/O manipulators - file handling – random access – object serialization – namespaces - std namespace – ANSI String Objects – standard template library |
| **Unit-6Advances in C++ Programming 2 lecture hours** |
| The advances and the latest trends in the course as well as the latest applications of the areas covered in the course. The latest research conducted in the areas covered in the course. Discussion of some latest papers published in IEEE transactions and ACM transactions, Web of Science and SCOPUS indexed journals as well as high impact factor conferences as well as symposiums. Discussion on some of the latest products available in the market based on the areas covered in the course and patents filed in the areas covered in the course. |