	Code & No:	CS120
	Credits:	4 (3,2,0)
Programming 2	Pre-requisite:	CS 110
	Co-requisite:	None
	Level:	4

### **Course Description:**

This course is an introductory course in object oriented programming. The fundamental concepts of object oriented programming will be studied using the C++ programming language.

# **Course Aims:**

- 1) State the basic concepts of Object Oriented Programming.
- 2) List the benefits of OOP over traditional structured programming
- 3) Help student to master the C++ implementation of object-oriented concepts including:
  - Encapsulation.
  - Information hiding.
  - Data abstraction.
  - Inheritance hierarchies.
  - Polymorphism.
  - Function overloading.
  - Operator overloading.
- 4) Implement object-oriented programs in C++.

 $\Box$ (f) An ability to communicate effectively with a range of audiences

# **Student Outcomes (SOs):**

- ☒(a) An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline
   ☒(b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
   ☒(c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
   ☒(d) An ability to function effectively on teams to accomplish a common goal
- $\Box$ (g) An ability to analyze the local and global impact of computing on individuals, organizations, and society

 $\square$  (e) An understanding of professional, ethical, legal, security and social issues and responsibilities

$\square$ (h) Recognition of the need for and an ability to engage in continuing professional development
$\square$ (i) An ability to use current techniques, skills, and tools necessary for computing practice.
$\square$ (j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices. [CS]
$\square$ (k) An ability to apply design and development principles in the construction of software systems of varying complexity. [CS]
□(j) An ability to use and apply current technical concepts and practices in the core information technologies of human computer interaction, information management, programming, networking, and web systems and technologies. [IT]
$\square$ (k) An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation, and administration of computer-based systems. [IT]
$\square$ (I) An ability to effectively integrate IT-based solutions into the user environment. [IT]
□(m) An understanding of best practices and standards and their application. [IT]
$\square$ (n) An ability to assist in the creation of an effective project plan. [IT]
Course Learning Outcomes (CLOs):
<ol> <li>Understand the basic OO programming concepts.</li> <li>Compare the OO programming approach against the traditional approach.</li> <li>Identify the main objects/classes, methods, attributes from given problem specifications.</li> <li>Design and code small to medium sized problems from the start using the appropriate OO concepts and other concepts introduced (class, inheritance, polymorphism, generic programming etc.)</li> <li>Create and manipulate Files using the available I/O file streams classes.</li> <li>Contribute to a group effort to realize an OOP based solution</li> </ol>
SOs and CLOs Mapping:
CIO/SO a h c d e f a h i i k l m n

CLO1

CLO2

CLO3

CLO4

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CLO5		٧						
CLO6			٧					

No.	Topics	Weeks	Teaching hours
1	Classes and Objects	2	6
2	Functions	2	6
3	Inheritance	2	6
4	Polymorphism	2	6
5	Operator overloading	2	6
6	File Processing	2	6
7	Templates	2	6
		14	42

#### Textbook:

• C++: How To Program, Deitel and Deitel, Prentice Hall, 9<sup>th</sup> ed. 2013

## **Essential references:**

- The C++ Programming Language: Special Edition, BjarneStroustrup, 4<sup>th</sup> edition, Addison-Wesley Professional, 2013.
- C++ Programming: From Problem Analysis to Program Design, De D. S. Malik, Cengage Learning, 2012.
- C++ Programming for the Absolute Beginner, De Dirk Henkemans and Mark Lee, Thomson Course, Technology, 2009.
- Object Oriented Programming with C++, by Balagurusamy (Author), Publisher: TMH; Sixth edition (1 June 2013), ISBN-13: 978-1259029936