15SE201J	OBJECT ORIENTED PROGRAMMING USING C++	L	T	P	C
		3	0	2	4
Co-requisite:	NIL				
Prerequisite:	NIL				
Data Book / Codes/Standards	NIL				
Course Category	P PROFESSIONAL CORE				
Course designed by	Department of Software Engineering				
Approval	32nd Academic Council Meeting, May 2016				

PURPOSE	Real world is full of objects and problems can be best solved using object oriented approach. The pioneer programming language to implement object oriented features is C++. This course aims at building object oriented skills through programming in C++.							
INSTRUCTIONAL OBJECTIVES		**STUDENT OUTCOMES**						
At the end of the course, student will be able to								
1.	Apply the basic object oriented features	a	c					
2.	Develop Generic programming skills	a	c					
3.	Apply appropriate data structures and solve complex problems by applying the skills acquired so far	a	b	i				
4.	Design problem into classes and develop a full working code	a	c					
5.	Develop programs using Streams, files, templates and handle exceptions	a	c	i				

Session	Description of Topic	Contact Hours	C-D-I-O	IOs	Reference
	UNIT I : INTRODUCTION TO OBJECT-ORIENTED PROGRAMMING	**10**			
1.	Need of Object-Oriented Programming - Comparison of procedural programming and Object-Oriented Programming	1	C	1	1
2.	Characteristics of Object-Oriented Languages	1	C	1	1
3.	C++ Programming Basics: Basic Program Construction	1	C	1	1
4.	Data Types, Variables, Constants	1	C	1	1
5.	Type Conversion, Operators, Library Functions	1	C	1	1
6.	Loops and Decisions, Structures	2	C	1,2	1
7.	Functions : Simple Functions, Passing arguments, Returning values, Reference Arguments	1	C	1,2	1
8.	Recursion, Inline Functions, Default Arguments Storage Classes	1	C	1,2	1
9.	Arrays , Strings	1	C	1,2	1
	UNIT II: FEATURES OF OBJECT-ORIENTED PROGRAMMING	**11**			

10.	Introduction to Classes and Objects	1	C	1	1,2,3
11.	Constructors and its types, Destructors	1	C,I	1,2	1,2,3
12.	Passing Objects as Function arguments and Returning Objects from Functions	1	C,I	1,3,4	1,2,3
13.	Operator Overloading	1	C,I	1,2	1,2,3
14.	Inheritance	2	C,I	1,3,4	1,2,3
15.	Overloading Member Functions	1	C,I	1,2	1,2,3
16.	Pointers	2	C,I	1,3,4	1,2,3
17.	Virtual Functions – Friend Functions, Static Functions	2	C,I	1,2	1,2
	UNIT III : STREAMS AND FILES	**7**			
18.	Streams: Classes and Errors	1	C	5	1,3,4
19.	Disk File I/O with Streams	1	C,I	5	1,3,4
20.	Files: File Pointers, Error handling in File I/O, File I/O with member Functions	3	C,I	3,5	1,3,4
21.	Overloading the extraction and Insertion Operators	1	C,I	5	1,3,4
22.	Multi File Programs	1	C,I	5	1,3,4
	UNIT IV: TEMPLATES, EXCEPTIONS	**7**			
23.	Templates : Function templates, Class templates	2	C	5	1,3,4
24.	Exceptions: Need of Exceptions, keywords, Simple and Multiple Exceptions	3	C,I	5	1,3,4
25.	Re-throwing Exception and Exception Specifications, Custom Exception	2	C,I	5	1,3,4
	UNIT V: STANDARD TEMPLATE LIBRARY	**10**			
26.	Introduction to STL: Containers, Algorithms, iterators - potential problems with STL	2	C,I	5	1
27.	Algorithms: find(), count(), sort(),search(),merge()	1	C,I	5	1
28.	Function Objects: for_each() , transform()	1	C,I	5	1
29.	Sequence Containers: vectors, Lists, Deques	2	C,,I	3,5	1
30.	Iterators and specialized iterators	1	C,I	5	1

31.	Associative Containers: Sets and Multisets Maps and multimaps	2	C,I	3,5	1
32.	Storing User, Defined Objects , Function Objects	1	C	5	1
	TOTAL CONTACT HOURS	45			

Sl. No.	LEARNING RESOURCES
1.	Robert Lafore, "*Object-Oriented Programming in C++*", 4th edition, SAMS Publishing, 2008, ISBN-13: 978-0672323089
2.	Deitel, "*C++ How to Program*", 6th edition, PHI publication, 2008, ISBN-13: 978-8120334960
3.	R. Subburaj, "Object Oriented Programming With C++ ", Vikas Publishing House, New Delhi, Revised Edition 2013.
4.	*E.Balaguruswamy "Object Oriented Programming with C++", 6th edition, Tata McGraw Hill Education, 2015,* ISBN-13: 978-1259029936
5.	Joyce Farrell, "Object Oriented Programming", 4th edition, Cengage learning, 2009, ISBN-13: 978-8131505175
6.	*Nicolai M. Jossutis, "Object-Oriented Programming in C++", Wiley Publications, 2002,* ISBN-13: 978-0470843994
7.	Bjarne Stroustrup ,"The C++ Programming Language", 4th Edition, Addison Wesley, 2015, ISBN-13: 978-0321563842
8.	Stanley Lippman, JoseeLajoie, Barbara E. Moo ,"C++ Primer", 5th Edition, Addison Wesley, 2015, ISBN-13: 978-0321714114
9.	Bhusan Trivedi, "Programming with ANSI C++", 2nd edition, Oxford higher education,2014,ISBN:978-0198083962

Sl. No.	Description of Experiments	Contact Hours	C-D-I-O	IOs	Reference
	Each student is assigned with an application in Session 1. Students have to complete the below listed experiments with respect to the assigned application.				
1.	Identifying appropriate data types, variables and simple programs to understand the basic program structure	2	C,D,I	1	1-8
2.	Programs for control structures and loops	2	C,D,I	1	1-8
3.	Simple Programs to construct a class structure with methods and arguments	2	C,D,I	1,2	1-8
4.	Programs to develop their skills on Inheritance	2	C,D,I	1,4	1-8
5.	Programs to improve their skills on polymorphism	2	C,D,I	1,4	1-8
6.	Programs to construct Functions, Inline functions, and Virtual functions	4	C,D,I	1,4	1-8
7.	Develop a complete logic for the assigned application including all the concepts done so far	4	C,D,I	3,4	1-8
8.	Programs to improve the skills on reading and storing from and to files	2	C,D,I	5	1-8
9.	Programs for manipulating pointers	4	C,D,I	1,2, 4	1-8
10.	Programs to construct templates and handle exceptions	2	C,D,I	5	1-8
11.	Programs to construct a STL for Sequential containers and iterators	2	C,D,I	5	1-8
12.	Programs to construct a STL for Associative containers	2	C,D,I	5	1-8
	TOTAL CONTACT HOURS	30			