Course Description

.

Course Code	15B11CI211	**Semester** Even	**Semester** 2nd **Session** 2019 -2020 **Month from** January to June
Course Name	Software Development Fundamentals - II		
Credits	4	**Contact Hours**	3 (L) + 1 (T)

Faculty (Names)	**Coordinator(s)**	Sec-62: Dr. Niyati Aggrawal, Dr. Suma Dawn Sec-128: Dr. Arti Jain
	Teacher(s) (Alphabetically)	Sec-62: Aditi Sharma, Dr. Alka Singhal, Dr. Amarjeet Kaur, Mradula Sharma, Dr. Neha Bansal, Dr. Niyati Aggrawal, Dr. Parul Agarwal, Dr. Pawan Singh Mehra, Sakshi Agarwal, Dr. Suma Dawn, Dr.Taj Alam Sec-128: Dr. Arti Jain, Dr. Charu, Dr. Chetna Gupta, Dr. Himani Bansal, Himanshu Mittal, Rupesh Koshariya

COURSE OUTCOMES		**COGNITIVE LEVELS**
C110.1	Develop C programs using structures, pointers, functions, and files.	Apply Level (C3)
C110.2	Solve problems related to data storage, retrieval, searching, and sorting by utilizing stack/queue.	Apply Level (C3)
C110.3	Make use of linked list to solve various problems.	Apply Level (C3)
C110.4	Apply binary tree data structure to perform operations like searching, insertion, deletion, and traversing.	Apply Level (C3)
C110.5	Explain basic features of object-oriented design such as objects, classes, encapsulation, polymorphism, inheritance, and abstraction.	Understand Level (C2)
C110.6	Develop C++ programs using OOPs concepts like encapsulation, inheritance, polymorphism, and standard template library.	Apply Level (C3)

Module No.	**Title of the Module**	**Topics in the Module**	**No. of Lectures for the module**
1.	Advanced C programming	Derived data types – **Enumerated,** structure and Union; Revision of Functions, Pointers, Pointer arithmetic, Pointer-to-Pointers, Pointers and Arrays & Strings (1D, 2D, **MD, array of pointers**), Pointers-to-Functions, Pointer-to-Strucures, Pointers within Structures, Structures and Functions, Unions; **Function Prototypes**, Arguments Passing; Recursion; FILE handling (binary and text) – reading and writing; Searching – Linear, and binary search; Sorting – bubble, insertion, and selection; **Bitwise Operations**; Stacks – implementation (array-	16

		based) and applications	
2.	Implementations and applications of elementary data structures	Queues: linear, and queue applications, circular, deque – implementation and applications; **Dynamic Memory Allocation** Linked list - application, storage; sparse matrix; Binary trees- implementation using arrays and pointers.	15
3.	Object Oriented Programming	Introduction to Object-Oriented Programming using C++, objects, classes, methods, implementing functions in the class, use of scope resolution operator, Access Modifiers, static functions and static data members, constructor and destructors, Inheritance: single, multiple, multi-level and hybrid, Polymorphism: function and operator overloading, virtual member functions, abstract base classes and pure virtual functions, Introduction to SDLC.	14
		Total number of Lectures	**45**

Evaluation Criteria

Components	**Maximum Marks**
T1	20
T2	20
End Semester	35
TA	25 (Attendance = 07; Class Test, Quizzes, etc = 07; Internal assessment = 05 Assignments in PBL mode = 06.)
Total	**100**

Text Reading material:

1.	E. Balagurusamy, "Programming In Ansi C", McGraw Hill Education India Pvt Ltd, 8th Edition, 2019.
2.	B. S. Gottfried, "Programming with C", Schaum's Outlines, Mc Graw Hill, 4th Edition.
3.	G. Perry, and D. Miller, "C Programming Absolute Beginner's Guide, QUE Publication, 3rd Edition, 2013.
4.	David Griffiths, and Dawn Griffiths "Head First C 1/e Edition", O'Reilly Publication, 2012.
5	B. Stroustrup, "The C++ Programming Language", 4th Edition, Addison-Wesley, 2013.
6.	T. Gaddis, "Starting Out with C++ from Control Structures to Objects", 9th edition, Pearson Publication, 2017.
7.	B. E. Moo, J. Lajoie, S. B. Lippman, "C++ Primer", 5th Edition, Addison-Wesley Professional, 2013.
8.	Y. P. Kanetkar, "Exploring C", BPB Publication, 2nd Edition, 2014.
9.	D. S. Malik, "C++ Programming: From Problem Analysis to Program Design, 6th Edition, Course Technology, Cengage Learning, 2012
10.	R. Thareja, "Computer Fundamentals and Programming in C", Oxford University Press, 2012.
11.	Study Material provided by faculty

Recommended Reading material:	
1	B W. Kernighan and Dennis M. Ritchie, “The C Programming Language”, 2nd Edition, Prentice-Hall India, New Delhi, 2002.
2	H. Schildt, **“**C: The Complete Reference”, Tata McGraw-Hill Education, 4th Edition, TMH 2000.
3	E. Horowitz, S. Sahni, “Fundamentals of Data Structures in C”, 2008, Silicon press
4	E Balaguruswamy, “Object Oriented Programming with C++”, 4th Edition, TMH, 2008
5	P. van der Linden, “Expert C Programming: Deep C Secrets”, Prentice Hall, ISBN: 0131774298.
6	M. Vine, “C Programming for the Absolute Beginner”, Second Edition, 2008 Thomson Course Technology.
7	T. A. Budd, “An Introduction to Ob ject-Oriented Programming”, 3rd Edition, Addison-Wesley, 2001
8	Y. Kanethkar, “Let Us C”, BPB Publication, 16th Edition, 2018.
9	R. Lafore, “Object-Oriented Programming in C++”, Fourth Edition, Sams Publishing, 2002.