SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Department of Information Technology	LP: CS18551
B.E/B.Tech/M.E/M.Tech : B.E Regulation: 2018A	Rev. No: 03
PG Specialisation : --	Date: 10/07/2023
Sub. Code / Sub. Name : CS18551/Programming and Data Structures	
Unit : I	

DATA ABSTRACTION & OVERLOADING

Unit Syllabus: Overview of C++ – Structures – Class Scope and Accessing Class Members – Reference Variables – Initialization – Constructors – Destructors – Member Functions and Classes – Friend Function – Dynamic Memory Allocation – Static Class Members – Proxy Classes – Overloading: Function overloading and Operator Overloading

Objective:

- To comprehend the fundamentals of object oriented programming

Session No *	Topics to be covered	Ref	Teaching Aids
1	Overview of C++ – Structures,loops,functions	6-Ch.2; Pg.21-43	LCD/BB
2	Class Scope and Accessing Class Members	1- Ch 9 ; Pg.. 438-439	LCD/BB
3	Reference Variables – Initialization	6-Ch.2; Pg.21-43	LCD/BB
4	Constructors – Destructors	1- Ch 9 ; Pg.. 439-446 6-Ch.10; Pg. 226-228	LCD/BB
5	Member Functions and Classes	1-Ch 9 ; Pg.. 427-433 6-Ch.10; Pg. 224-225	LCD/BB
6	Friend Functions Sample Programs: Complex number addition	1- Ch 9 ; Pg.. 461-463 6-Ch.2; Pg.238-240	LCD/BB
7	Dynamic Memory Allocation – Static Class Members –	1- Ch 9 ; Pg.. 469-470 6-Ch.6; Pg.127-130	LCD/BB
8	Proxy Classes - Overloading: Function overloading	6-Ch.7; Pg.149-153	LCD/BB
9	Overloading: Operator Overloading Practice programs in C++ concepts	1- Ch 10 ; Pg. 487-500 6-Ch.11; Pg.261-297	LCD/BB
Content beyond syllabus covered (if any):			

* Session duration: 50 minutes

Sub. Code / Sub. Name: CS18551/Programming and Data Structures

Unit : II

INHERITANCE & POLYMORPHISM

Unit Syllabus : Base Classes and Derived Classes – Protected Members – Casting Class pointers and Member Functions – Overriding – Public, Protected and Private Inheritance – Constructors and Destructors in derived Classes – Implicit Derived – Composition Vs. Inheritance – Virtual functions – This Pointer – Abstract Base Classes and Concrete Classes – Virtual Destructors – Dynamic Binding

Objective:

- To use object oriented programming to implement data structures

Session No *	Topics to be covered	Ref	Teaching Aids
10	Base Classes and Derived Classes – Protected Members	1- Ch 11 ; Pg. 539-559	LCD/BB
11	Casting Class pointers and Member Functions	Internet	LCD/BB
12	Overriding – Public, Protected and Private Inheritance	1- Ch 11 ; Pg..563-565 6- Ch.2 ; Pg.38-40, 6 - Ch.15; Pg.390-402	LCD/BB
13	Constructors and Destructors in derived Classes	1- Ch 11 ; Pg..565-566	LCD/BB
14	Implicit Derived	1-Ch 12; Pg.. 533-540	LCD/BB
15	Composition Vs. Inheritance	Internet	LCD/BB
16	Virtual functions- This Pointer	1- Ch 12 ; Pg..580-586 1- Ch 9 ; Pg.. 463-465	LCD/BB
17	Abstract Base Classes and Concrete Classes	1- Ch 12 ; Pg..587-589	LCD/BB
18	Virtual Destructors – Dynamic Binding	1- Ch 12 ; Pg..586-587	LCD/BB

Content beyond syllabus covered (if any):

Pure Virtual Functions , applications of inheritance and overriding

* Session duration: 50 mins

SRI VENKATESWARA COLLEGE OF ENGINEERING

COURSE DELIVERY PLAN - THEORY

Sub. Code / Sub. Name: CS18551/Programming and Data Structures

Unit : III

LINEAR DATA STRUCTURES

Unit Syllabus: Abstract Data Types (ADTs) – List ADT – array-based implementation – linked list implementation – singly linked lists –Polynomial Manipulation - Stack ADT – Evaluating arithmetic expressions- Queue ADT – Circular Queue implementation..

Objective:

- To introduce linear data structures and their applications.

Session No *	Topics to be covered	Ref	Teaching Aids
19	Abstract Data Types (ADTs)	2 Ch 3; Pg 77-78	LCD/BB
20	List ADT – array-based implementation –	4-Ch 3;Pg. 104-109	LCD/BB
21	List ADT- linked list implementation	4-Ch 6;Pg 238-242	LCD/BB
22	Singly linked lists	4-Ch 11;Pg 117-121 5- Ch 10; Pg 236-241	LCD/BB
23	Polynomial Manipulation	Internet	LCD/BB
24	Stack ADT	4-Ch 5;Pg 14-202 7; Ch 2- Pg 69-76	LCD/BB
25	Evaluating arithmetic expressions	5- Ch 10; Pg 236-241	LCD/BB
26	Queue ADT	4-Ch 5;Pg 208-211 5- Ch 10; Pg 232-236	LCD/BB
27	Circular Queue implementation	4-Ch 5;Pg 211-213	LCD/BB

Content beyond syllabus covered (if any): Doubly Linked List

* Session duration: 50 minutes

Sub. Code / Sub. Name: CS18551/Programming and Data Structures

Unit : IV

NON-LINEAR DATA STRUCTURES

Unit Syllabus : Trees – Binary Trees – Binary tree representation and traversals - The Search Tree ADT - Binary Search Trees- – Application of trees – Graph and its representations – Graph Traversals – Representation of Graphs – Breadth-first search – Depth-first search- Dijkstra's shortest path algorithm

Objective:

- To introduce non-linear data structures and their applications.

Session No *	Topics to be covered	Ref	Teaching Aids
28	Trees – Binary Trees	2-Ch4; Pg.133-138	LCD/BB
29	Binary tree representation and traversals —	2-Ch4; Pg. 139-143	LCD/BB
30	The Search Tree ADT - Binary Search Trees- Application of trees	2-Ch4; Pg.144-154 2-Ch4; Pg 128-132	LCD/BB
31	Graph and its representations	2-Ch.9; Pg.359-362 5–Ch.22; Pg.527-530	LCD/BB
32	Representation of Graphs	2-Ch.9; Pg.359-362 5–Ch.22; Pg.527-530	LCD/BB
33	Graph Traversals	2-Ch.9;Pg.398-410 4–Ch.12; Pg.595-610 5–Ch.22; Pg.531-544	LCD/BB
34	Breadth-first search – Depth-first search	2-Ch.9;Pg.398-410 4–Ch.12; Pg.595-610 5–Ch.22; Pg.531-544	LCD/BB
35	Dijkstra's shortest path algorithm	2-Ch.9; Pg.371-380 4–Ch.12; Pg.627-632 5–Ch.24; Pg.595-596	LCD/BB
36	Problems in Trees and Graphs		LCD/BB

Content beyond syllabus covered (if any):

* Session duration: 50 mins

Sub. Code / Sub. Name: CS18551/Programming and Data Structures

Unit : V

SORTING and SEARCHING

Unit Syllabus : Sorting algorithms: Insertion sort - Quick sort - Merge sort - Searching: Linear search –Binary Search

Objective:

- Learn to implement sorting and searching algorithms.

Session No *	Topics to be covered	Ref	Teaching Aids
37	Sorting algorithms-Introduction	5- Ch 6; Pg 147-151	LCD/BB
38	Insertion sort	5- Ch 2; Pg 16-23	LCD/BB
39,40	Quick sort	4-Ch 11;Pg 513-521 5- Ch 7; Pg 170-179	LCD/BB
41	Merge sort	5- Ch 7; Pg 170-179	LCD/BB
42	Linear search	4- Ch 11;Pg 500-510	LCD/BB
43,44	Binary Search	2-Ch2,;Pg 67 5- Ch 2; Pg 22	LCD/BB
45	Problems in sorting and searching		LCD/BB

Content beyond syllabus covered (if any): Bubble sort

* Session duration: 50 mins

Sub. Code / Sub. Name: CS18551/Programming and Data Structures

REFERENCES:

1. Deitel and Deitel, "C++, How To Program", Tenth Edition, Pearson Education, 2017.
2. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C++", 2nd Edition, Pearson Education, 2017.
3. Bhushan Trivedi, "Programming with ANSI C++, A Step-By-Step approach", Oxford University Press, 2012.
4. Goodrich, Michael T., Roberto Tamassia, David Mount, "Data Structures and Algorithms in C++", Second Edition, Wiley. 2011.
5. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein, "Introduction to Algorithms", Third Edition, MIT Press, 2009.
6. Bjarne Stroustrup, "The C++ Programming Language", 4th Edition, Pearson Education, 2018.
7. Ellis Horowitz, SartajSahni and Dinesh Mehta, "Fundamentals of Data Structures in C++", Galgotia Publications, Second Edition,2008

	Prepared by	Approved by
Signature	10/07/23 10/7/23	10/7/23
Name	Dr. A. Indumathi, Ms. N. Uma	Dr. V. Vidhya
Designation	Associate Professor, Assistant Professor/ INT	Professor and Head/ INT
Date	10/07/2023	10/07/2023
Remarks* :		

* If the same lesson plan is followed in the subsequent semester/year it should be mentioned and signed by the Faculty and the HOD