SRM UNIVERSITY
FACULTY OF ENGINEERING AND TECHNOLOGY
SCHOOL OF COMPUTING
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
COURSE PLAN

Course Code : 15CS201J
Course Title : Data Structures
Semester : III
Course Time : JULY - DECEMBER 2017
Slot : E

Day	**All Section students**	
	Hour	**Timing**
DAY 1		
DAY 2		
DAY 3	9:45 - 10:35 (Batch 1)	2:20 - 3:10 (Batch 2)
DAY 4		
DAY 5	8:00 - 9:40 (Batch 1)	12:30 - 2:15 (Batch 2)

Location : Tech Park, University Building
Faculty Details :

S.No	**Name**	**Office**	**Office hour**	**Group**	**Mail id**
1	MR. A SELVAKUMAR	TP710C	All Day Order 9:30 - 5:00	BATCH 1	Selvakumar.a@ktr.srmuniv.ac.in
2	MRS. S KIRUTHIKA DEVI	TP806A	All Day Order 9:30 - 5:00	BATCH 1	Kiruthikadevi.s@ktr.srmuniv.ac.in
3	MRS. S GIRIJA	TP003A	All Day Order 9:30 - 5:00	BATCH 1	Girija.s@ktr.srmuniv.ac.in
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7	MRS. T Y J NAGA MALLESWARI	TP003A	All Day Order 9:30 - 5:00	BATCH 1	nagamalleswari.t@ktr.srmuniv.ac.in
8	DR. C N SUBALALITHA	TP806A	All Day Order 9:30 - 5:00	BATCH 1	subalalitha.n@ktr.srmuniv.ac.in
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16	MR. M ELIAZER	TP710	All Day Order 9:30 - 5:00	BATCH 2	Eliazer.m@ktr.srmuniv.ac.in

17	MR. R SUBASH	TP612	All Day Order 9:30 - 5:00	BATCH 2	Subash.r@ktr.srmuniv.ac.in
18	MS.P MAHALAKSHMI	TP603A	All Day Order 9:30 - 5:00	BATCH 2	mahalakshmi.p@ktr.srmuniv.ac.in
19	DR.C N SUBALALITHA	TP806A	All Day Order 9:30 - 5:00	BATCH 2	subalalitha.n@ktr.srmuniv.ac.in
20	MS UMA DEVI	TP709	All Day Order 9:30 - 5:00	BATCH 2	umadevi.mu@ktr.srmuniv.ac.in

Text Books:

1. Seymour Lipschutz, "Data Structures with C", McGraw Hill Education, Special Indian Edition, 2014.
2. R.F.Gilberg, B.A.Forouzan, "Data Structures", Second Edition, Thomson India Edition, 2005.

Reference Books

3. A.V.Aho, J.E Hopcroft and J.D.Ullman, "Data structures and Algorithms", Pearson Education, First Edition Reprint 2003.
4. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", 2nd Edition, Pearson Education,
5. Reema Thareja, "Data Structures Using C", Oxford 2011. Higher Education , First Edition, 2011

Prerequisite : NIL

Instructional Objectives

1. Understand analysis of algorithm and its time complexity
2. Be familiar with and implement the Linked list data structure
3. Be familiar with and implement the Stack and Queue data structure
4. Have a comprehensive knowledge of Trees and their implementations
5. Learn advanced data structures like Graphs and their implementation, hash tables and Hashing methods

Assessment

Cycle Test – I : 15 Marks
Cycle Test – II : 25 Marks
Surprise Test – I : 5 Marks
Viva and Assignment : 5 Marks

Test Schedule

S.No.	DATE	TEST	TOPICS	DURATION
1	**21/8/2017 onwards**	**Cycle Test – I**	**Unit I & II**	**2 Hours**
2	**23/10/2017onwards**	**Cycle Test – II**	**Unit III,IV and V**	**3 Hours**

Detailed Session Plan:

UNIT I: INTRODUCTION TO DATA STRUCTURES					
Session No.	**Topics to be covered**	**Time (min)**	**Ref**	**Teaching Method**	**Testing Method**
1	Introduction : Basic terminology - Data structures – Data structure operations	50	1	BB	Group discussion Quiz
2	ADT – Algorithms: Complexity, Time – Space trade off	50	1	BB	Group discussion Quiz
3	Mathematical notations and functions	50	1	BB	Group discussion

					Illustration by examples
4	Asymptotic notations – Linear and Binary search	50	1	BB	Group discussion Quiz
5	Asymptotic notations – Bubble sort	50	1	BB	Group discussion, Illustration by examples
6	Asymptotic notations – Insertion sort	50	1	BB	Group discussion, Illustration by examples
UNIT II: ARRAYS AND LIST					
7	Array : Operations on Arrays, Applications of Arrays	50	1	BB	Group Discussion Illustration by examples
8	Multidimensional Arrays : Sparse Matrix	50	2	BB	Group Discussion, Illustration by examples
9	Linked List : Insertion, Deletion and Search, Cursor based implementation	50	2	BB	Group discussion
10	Polynomial Arithmetic	50	1	BB	Group discussion, Quiz Illustration by examples
11	Circular Linked List – Applications – Josephus Problem	50	1	BB	Group discussion, Illustration by examples
12	Doubly linked list: Insertion, Deletion and Search	50	2	BB	Group discussion, Illustration by examples
UNIT III: STACK AND QUEUE					
13	Stack: Array implementation, Linked list implementation	50	1	PPT	Quiz Group discussion
14	Applications of Stack – Infix to Postfix – Evaluation of Postfix	50	2	PPT	Group discussion, Illustration by examples
15	Application of Stack – Balancing symbols – Nested function calls	50	1	PPT	Group discussion , Illustration by examples
16	Recursion – Towers of Hanoi	50	1	PPT	Group discussion Illustration by examples
17	Queue – Array implementation , Linked List implementation	50	1	PPT	Group discussion
18	Circular Queue	50	1	PPT	Quiz, Illustration by examples
19	Applications of Queue – Priority queue – Double ended queue	50	2	PPT	Group discussion, Illustration by examples
UNIT IV: TREES					
20	General trees – Terminology – Representation of trees – Tree traversal	50	1	BB	Group discussion Quiz
21	Binary tree – Representation – Expression tree – Binary tree traversal, Threaded Binary Tree	50	1	PPT	Group discussion Illustration by examples
22	Binary Search Tree – Construction - Searching , Deletion	50	2	BB	Group discussion Illustration by examples
23	AVL trees – Rotation, Insertion	50	2	PPT	Group discussion
24	B-Trees, construction, searching, deletion	50	2	PPT	Group discussion , Quiz
25	Splay trees	50	1	PPT	Quiz Group discussion
26	Red-Black Trees	50	2	PPT	Group discussion , Quiz

UNIT V: GRAPHS AND HASH TABLES					
27	Graph Terminology, Graph traversal, Topological sorting	50	1	PPT	Group discussion
28	Minimum spanning tree – Prims - Kruskals	50	2	PPT	Group discussion
29	Network flow problem	50	1	BB	Group discussion,
30	Shortest Path Algorithm: Dijkstra	50	2	BB	Group discussion Illustration by examples
31	Graph Search: Depth First Search, Breadth First Search	50	1	BB	Group discussion, Quiz
32	Hashing: Hash functions, Collision avoidance, Separate chaining	50	1	BB	Group discussion, Illustration by examples
33	Open addressing: Linear probing, Quadratic Probing, Double hashing, Rehashing, Extensible Hashing	50	2	BB	Group discussion Illustration by examples

Prepared By
(A SELVAKUMAR)

Head of the Department