<u>Data Structure and Algorithms</u>
<u>Session: January'2020 - April'2020</u>

1. Course Number and Name:

CSE 2001, Data Structure and Algorithms

2. Credits and Course Format:

4 Credits, 3 Classes/Week, 1 hr/Class;
1 Lab./Week, 2 hrs/Lab.

3. Target Students:

Programme: B.Tech. (2nd Semester)
Branch: All

4. Instructor's Names:

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4. Text Book and References:

Text book
1. (T1) Data Structures and Algorithms in java by Goodrich and Tamassia, Wiley India

5. Specific Course Information:

a. Course Description:

Java primer, Object oriented design, fundamental data structures, algorithm analysis, recursion, stacks, queues, List, trees

b. Prerequisites and/or Co requisites:

Prerequisite: CSE 1001(ICP)

6. Course Learning Outcomes:

By the end of course through lectures, readings, homeworks, lab assignments and exams, students will be able to demonstrate the abilities:

(1) Ability to state and explain the basic programming syntax, semantics, building blocks .

(2) Ability to develop java applications using the programming tools like conditional statements, looping, arrays, methods and structure.

(3) Ability to analyze, debug and test the programs and correctly predict their output.

(4) Ability to differentiate behaviors of different data structures and their memory representation.

(5) Ability to choose the appropriate data structures that efficiently model the problem of interest.

(6) Ability to apply advanced programming technique for developing solution of different problems.

7. Brief List of Topics to Be Covered: (L: Lecture, P: Practical)

Contact Hours	Topics to be covered	Remarks(if any)
Week #1:		
L01	Introduction to the course and CO, PO	
L02	Object and classes	
L03	Object and classes contd..	
P01	EXPERIMENT 1: Java premier Programming Assignments	
Week # 2:		
L04	Object and classes contd..	
L05	Java Packages	
L06	Testing and debugging	
P02	EXPERIMENT 2: Assignment Based on Object Oriented Design	
Week # 3:		
L07	Inheritance	
L08	Inheritance contd..	
L09	Inheritance contd..	
P03	EXPERIMENT 3: Assignment Based on Object Oriented Design Contd..	
Week # 4:		
L10	Interfaces and Abstract Classes	
L11	Interfaces and Abstract classes contd..	
L12	Exceptions	
P04	EXPERIMENT 4: Assignment Based on Exceptions, Generics and Recursions	
Week # 5:		
L13	Exceptions Contd..	
L14	Casting and Generics	
L15	Casting and Generics contd.., Nested classes	
P05	EXPERIMENTS 5: Assignments based on Exceptions	
Week #6:		
L16	Fundamental Of Data Structures	
L17	Empirical Analysis	

L18	Common Mathematical Functions	
P 06	EXPERIMENT 6 : Assignments based on Generics.	
Week # 7:		
L 19	BigOh Notation	
L 20	BigOh Notation contd..	
L 21	Foundation of Recursion	
P 07	EXPERIMENT 7 : Assignments based on Recursion.	
Week # 8:		
L 22	Application of Recursion	
L 23	Single Linked List	
L 24	Single Linked List contd..	
P 08	EXPERIMENT 8 : Assignment based on Single Linked List	
Week # 9:		
L 25	Circular Linked List	
L 26	Double Linked List	
L 27	Double Linked List contd..	
P 09	EXPERIMENT 9 : Assignment based on Double Linked list	
Week # 10:		
L 28	Fundamentals of Stack, Stack using Array	
L 29	Stack using Linked List	
L 30	Stack Application, Matching Parentheses	
P 10	EXPERIMENT 10 : Assignment based on Stack	
Week # 11:		
L 31	Fundamentals of Queue, Queue using Array	
L 32	Queue using Linked List	
L 33	Circular Queue	
P 11	EXPERIMENT 11 : Assignment based on stack contd..	
Week # 12:		
L 34	Tree Definitions and properties	

L 35	Binary Trees	
L 36	Tree Representation using Linked List	
P 12	EXPERIMENT 12:Assignment based on Queue	
Week # 13:		
L 37	Tree Representation using Array	
L 38	Tree Traversal	
L 39	Tree Traversal contd.., Binary Search Tree	
P 13	EXPERIMENT 13:Assignment based on queue	

8. Evaluation scheme (under GP1):

Assignments :   20%
Attendance: 5%
Mid semester: 15%
End semester(Lab. Test):   15%
End semester(Theory):   45%