Regulation GRBT-20	Godavari Institute of Engineering & Technology (Autonomous)	I B.Tech II SEM.			
Course Code	**DATA STRUCTURES** CSE & ECE				
Teaching	Total contact hours-48	L	T	P	C
Prerequisite(s): Basic knowledge of Mathematics and C Language		3	0	0	3

Course Objective(s):

- Be familiar with basic techniques of algorithm analysis.
- Be familiar with writing recursive methods
- Be familiar with several sub-quadratic sorting algorithms including quick sort and merge sort
- Master the implementation of data structures such as stacks and queues.
- Master the implementation of linked data structures such as linked lists , graphs and binary trees
- Comprehensive knowledge of data structures and ability to implement the same in Software applications

Course Outcome(s):

After successful completion of this course, a student will be able to-

CO-1: To be able to choose appropriate data structure as applied to specified problem definition.

CO-2: To be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.

CO-3: To be able to apply concepts learned in various domains like DBMS, compiler construction.

CO-4: To be able to use linear and non-linear data structures like stacks, queues, linked list etc.

UNIT-1

Data structure- Definition, types of data structures

Recursion: Definition, Design Methodology and Implementation of recursive algorithms, Linear and binary recursion, recursive algorithms for factorial function, GCD computation, Fibonacci sequence.

Preliminaries of algorithm, Algorithm analysis and complexity.

Searching Techniques: Linear Search, Binary Search and Fibonacci Search.

Sorting Techniques: Insertion sort, selection sort, exchange-bubble sort, quick sort and merge sort Algorithms.

UNIT-2

Stacks: Basic Stack Operations, Representation of a Stack using Arrays,

Applications of Stack: Reversing list, Factorial Calculation, Infix to postfix Transformation, Evaluating Arithmetic Expressions.

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UNIT-3

Queues: Basic Queues Operations, Representation of a Queue using array, Implementation of Queue Operations using Stack.

Applications of Queues: Circular Queues, De-queue, Priority Queues.

UNIT-4

Linked Lists: Introduction, single linked list, representation of a linked list in memory, Operations on a single linked list, reversing a single linked list, Circular linked list and Double linked list.

UNIT-5

Trees-Binary Trees, terminology, representation and traversals-pre, post & in order traversals.

Graphs- terminology, representation and traversals (BFS&DFS).

Text Books

1. Data Structures with C, Seymour Lipscutz, Schaum's Outlines, TMH-special 2nd Edition
2. Data structures using C, 2nd Edition, ReemaThareja, Oxford higher education.

Reference Books

1. Data structures: A Pseudo code Approach with C, 2nd edition, R.F.Gilberg and B.A.Forouzan, Cengage Learning
2. Data structures A Programming Approach with C, D.S.Kushwaha and A.K.Misra, PHI.
3. Data structures and Algorithm Analysis in C, 2nd edition, M.A.Weiss, Pearson.
4. Data Structures using C, A.M.Tanenbaum, Y. Langsam, M.J.Augenstein, Pearson.

CO-PO Mapping:

(1: Slight [Low]; 2: Moderate[Medium]; 3: Substantial[High], '-' : No Correlation)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	-	-	2	-	-	-	-	-	-	-	-	-
CO3	-	-	-	-	3	-	-	-	-	-	-	-
CO4	-	-	-	-	3	-	-	-	-	-	-	-
CO5	-	-	-	-	3	-	-	-	-	-	-	-

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