NARSIMHA REDDY ENGINEERING COLLEGE
UGC-AUTONOMOUS INSTITUTION
Your roots to success...

An **Autonomous** Institute
NAAC Accreditation **'A'** Grade
Accredited by **NBA**
Approved by **AICTE**, Affiliated to **JNTUH**

School of Computer Science

DATA STRUCTURES

B Tech II Year I Sem

Course Code	Category	Hours/ Week			Credits	Maximum Marks		
		L	T	P		CIA	SEE	TOTAL
23CS302	**Professional Core**	3	0	0	3	40	60	100
Contact Classes: 48	**Tutorial Classes: Nil**	**Practical Classes: 30**				**Total Classes:48**		

Prerequisites: Programming for Problem Solving

Course Objectives

1. Exploring basic data structures such as stacks and queues.
2. Introduces a variety of data structures such as hash tables, search trees, tries, heaps, graphs.
3. Introduces sorting and pattern matching algorithms

Course Outcomes

1. Ability to select the data structures that efficiently model the information in a problem.
2. Ability to assess efficiency trade-offs among   different data structure implementations or
3. combinations.
4. Implement and know the application of algorithms for sorting and pattern matching.
5. Design programs using a variety of data structures, including hash tables, binary and general
6. tree structures, search trees, tries, heaps, graphs, and AVL-trees.

UNIT – I

Introduction to Data Structures, abstract data types, Linear list – singly linked list implementation, insertion, deletion and searching operations on linear list, Stacks-Operations, array and linked representations of stacks, stack applications, Queues-operations, array and linked representations.

UNIT – II

Dictionaries: linear list representation, skip list representation, operations - insertion, deletion and searching. Hash Table Representation: hash functions, collision resolution-separate chaining, open addressing linear probing, quadratic probing, double hashing, rehashing, extendible hashing.

UNIT – III

Search Trees: Binary Search Trees, Definition, Implementation, Operations-Searching,

Insertion and Deletion, B- Trees, B+ Trees, AVL Trees, Definition, Height of an AVL Tree, Operations – Insertion, Deletion and Searching, Red –Black, Splay Trees

UNIT – IV

Graphs: Graph Implementation Methods. Graph Traversal Methods. Sorting: Quick Sort, Heap Sort, External Sorting- Model for external sorting, Merge Sort.

UNIT - V

Pattern Matching and Tries: Pattern matching algorithms-Brute force, the Boyer – Moore algorithm, the
Knuth-Morris-Pratt algorithm, Standard Tries, Compressed Tries, Suffix tries.

TEXT BOOKS:

1. Fundamentals of Data Structures in C, 2 nd Edition, E. Horowitz, S. Sahni and Susan Anderson
2. Freed, Universities Press.
3. Data Structures using C – A. S.Tanenbaum, Y. Langsam, and M.J. Augenstein, PHI/Pearson
4. Education.

REFERENCE BOOK:
1. Data Structures: A Pseudocode Approach with C, 2 nd Edition, R. F. Gilberg and B.A.Forouzan, Cengage Lear