

**SARDAR PATEL UNIVERSITY**  
**Programme: BCA Semester: III**  
**Syllabus with effect from: June 2019**

Paper Code : <b>US03CBCA25</b>	<b>Total Credit: 4</b>
Title of Paper: <b>Data Structures- I</b>	

**Lectures per week: 4**

**Exam Duration: 3hrs**

**All units carry equal weightage.**

Unit	Description in detail	Weightage %
I	<b>Introduction to Data Structures</b> <ul style="list-style-type: none"> <li>➤ Introduction to data structures - Definition, Types of Data Structure, applications and advantages</li> <li>➤ Primitive and non-primitive data structures and operations on them</li> <li>➤ Introduction to arrays, one and two-dimensional arrays</li> <li>➤ Representation of arrays in memory : row-major and column-major order</li> <li>➤ Address calculation of elements of one and two-dimensional arrays</li> <li>➤ Applications of arrays</li> </ul>	<b>25%</b>
II	<b>Stack</b> <ul style="list-style-type: none"> <li>➤ Introduction</li> <li>➤ Operations of the Stack- Push, Pop, Peep, Change</li> <li>➤ Applications of the Stack: <ul style="list-style-type: none"> <li>• Infix, Postfix, Prefix Notation</li> <li>• Conversion: Infix to Postfix using manually and stack for parenthesis and Non-parenthesis</li> <li>• Recursion : Definition and example</li> </ul> </li> </ul>	<b>25%</b>
III	<b>Queues</b> <ul style="list-style-type: none"> <li>➤ Types of queues : Simple queues, Circular queues, Double ended queues, Priority Queue,</li> <li>➤ Applications of Queue</li> <li>➤ Operations of Simple and Circular Queue : Insert and Delete</li> </ul>	<b>25%</b>
IV	<b>Graph, MultiList and File Organization- I</b> <ul style="list-style-type: none"> <li>➤ Graph - Basic Terminologies like Graph, Diagraph, Directed edge, Weighted graph, Adjacent vertices, Self loop, Parallel edges, Multigraph, Simple graph, Complete graph, Cycle, Acyclic Graph, Isolated vertex, Degree of vertex, source node, sink node, Pendant vertex, Connected graph, strongly connected graph, weakly connected graph</li> <li>➤ MultiList</li> <li>➤ File Organization: Terminologies and concept, Structure of sequential files, Processing sequential files</li> </ul>	<b>25%</b>

**Basic Text & Reference Books:-**

1. Tremblay J. & Sorenson P. G.: An Introduction to Data Structures with Applications, 2<sup>nd</sup> Edition, Tata McGraw-Hill Edition, 1991.
2. Singh Bhagat & Naps Thomas: Introduction to Data Structures, Tata McGraw-Hill Publishing Co.Ltd., 1985.
3. R. B. Patel: Data Structure using C – Khanna Publications. ISBN: 81-87522-41-0
4. D. Samanta - Classis Data Structures, 2<sup>nd</sup> Edition – PHI Publication
5. G. S. Baluja - Data Structures through C, 4<sup>th</sup> Edition – Dhanpat Rai & Co.