AC –
Item No. –

As Per NEP 2020

Tolani College of Commerce (Autonomous)

Knowledge is Supreme

Title of the Course :Data Structures
Programme :B.Sc(Information Technology) Semester-II

Syllabus for 2 credit Course

From the academic year-2024-2025

Sr. No.	Heading	Particulars
1	**Description of the course :**	A data structure is a format for organizing, processing, retrieving and storing data so it can be easily accessed and effectively used. There are various types of data structures in basic and advanced categories that are used in every program or application that is developed.
2	**Vertical :**	Major
3	**Type :**	Theory and Practical
4	**Credit**:	2 credits (1 Credit = Theory and 1 Credit = Project Work)
5	**Hours Allotted :**	30 Hours
6	**Marks Allotted**:	50 Marks Continuous Evaluation =20 Semester End =30
7	**Course Objectives**: **1.**To learn basic techniques of algorithm analysis. **2.** Master the implementation of linked data structures such as linked lists and binary tree.	
8	**Course Outcomes**: **1.** Learners will gain deep understanding after the completion of the course, are expected to Implement abstract data types using arrays and linked list. **2.** Learners will be able to Apply the different linear data structures like Linked list,stack and queue to various computing problems.	

9	
	1. Module 1: Introduction to data structure, Array (15 Hours)
	• Data and Information, Data Structure, Classification of Data Structures, Primitive Data Types, Abstract Data Types, Data structure vs. File Organization, Operations on Data Structure, • Algorithm, Importance of Algorithm Analysis, Complexity of an Algorithm, Asymptotic Analysis and Notations, Big O Notation, Big Omega Notation, Big Theta Notation, Rate of Growth and Big O Notation**.** • Introduction, One Dimensional Array, Memory Representation of One Dimensional Array, Traversing, Insertion, Deletion, Searching, Sorting, Merging of Arrays, Advantages and Limitations of Arrays.
	Module 2: Linked List, Stack and Queue (15 Hours)
	• Linked List, One-way Linked List, Traversal of Linked List, Searching, Memory Allocation and De-allocation, Insertion in • Introduction, Operations on the Stack Memory Representation of Stack, Array Representation of Stack, Applications of Stack. • Introduction, Queue, Operations on the Queue, Memory Representation of Queue, Array representation of queue, Linked List

11	**Reference Books:** • **Author:** Maria Rukadikar, **Title** : Data Structure and Algorithm, **Publisher:** SPD 1st Edition, **Year:** 2017 • https://www.geeksforgeeks.org/data-structures/	
12	**Internal Continuous Assessment: 20%**	**Semester End Examination : 30%**
13	**Continuous Evaluation through:**	Practical Assessment
14		

Scheme of Evaluation Pattern
Table 1A: Scheme of Continuous Evaluation (CE/Practical)
Scheme of Evaluation Pattern

Sub-components	Maximum Marks	Conditions for passing
1) Practical	15	A learner must be present for each of the sub-components.
2) Journal and Viva	5	
Total	20	

Table 1B: Scheme of Semester End Examination (SEE) Evaluation
Question Paper Pattern for Semester End Examination (SEE)
Maximum Marks: 30 **Duration: I Hrs.**
Note: All questions are compulsory. Each question has an internal choice.

Question Number		Nature of Questions	Maximum Marks
1)	**Attempt any 3**		
	a)		15
	b)		
	c)		
	d)		
	e)		
2)	**Attempt any 3**		
	a)		15
	b)		
	c)		
	d)		
	e)		