GITAM INSTITUTE OF MANAGEMENT (GIM)
Gandhi Institute of Technology and Management (GITAM)
(Declared as Deemed to be University u/s 3 of UGC Act. 1956)
Visakhapatnam – 45.

Course Code: MAN 124	**Course Title: DATA STRUCTURES WITH C++**	
SEMESTER: II	**Course Type: Core**	**Credits: 3**
Home Programme(s):BBA (BUSINESS ANALYTICS)		**Batch: 2020- 2023**
Course Leader:		

Course description and learning outcomes

Data Structure is a particular way of organizing data in a computer so that it can be used efficiently. Understanding the data structure will help in efficiently managing the data and coming up with effective algorithms. The implementation of data structures are done in C++, one of the most popular object oriented language.

Learning objectives

- To acquaint students with the concepts of Data Structures
- To implement data structures in C++

On successful completion of this course, students will be able to:

	Learning Outcome	Assessment
CO1	Calculate Time Complexity of different algorithms	A1
CO2	Work with Linked Lists	A2, A3,A4
CO3	Implement Stack and Queue in C++	A2, A3,A4
CO4	Perform Searching and Sorting using C++	A2, A3,A4
CO5	Understand different concepts in trees and graphs	A2, A3,A4

Course outline and indicative content

Unit – I: (10 sessions) (CO1, L2)

Introduction to Data Structures – Basic Concepts, Classification of Data Structures, Algorithm: Basics, Algorithm Complexity and Asymptotic Analysis, Types of Algorithms – Greedy Algorithms, Divide and Conquer, Dynamic Programming

Unit – II: (10 sessions) (CO2, L3, L4, L5)

Linked Lists: Concept, Types of Linked List – Single, Double, Circular, Operations in Linked List, Applications of Linked List

Unit – III: (10 sessions) (CO3, L3, L4, L5)

Stack and Queue: – Concept, Operations on stack, Array representation, Linked List representation, application of stacks, Queues - Concept, operation on queues, types of queues, Array representation, Linked List representation application of queues

Unit – IV: (10 sessions) (CO4, L3, L4, L5)

Searching and Sorting: Introduction to searching – Linear search, Binary Search, Sorting – Bubble, Insertion, Selection, Quick, Hashing

Unit – V: (10 sessions) (CO5, L3, L4, L5)

Trees and Graphs: Trees - Basic terminology, Types of trees – General trees, Forest, Binary Tree, Binary Search tree, Creating binary tree from general tree, traversing a binary tree, application of trees, Graphs - Basic terminology, Directed graph, representation of graph, graph traversal algorithms, Application of graphs

Assessment methods

Task		Task type	Task mode	Weightage (%)
A1	Quiz	Individual		10
A2	Assignments / Lab Tasks / Written Test/Coursera Groups* or Individual	Individual / Group		20
A3	Record Work	Individual		10
A4	Lab Exam	Individual		60

Mapping Cos – Blooms Levels – Assessment Tools

Knowledge dimension / Cognitive dimension	L1. Remember	L2. Understand	L3. Apply	L4. Analyze	L5. Evaluate	L6. Create
Factual Knowledge						
Conceptual Knowledge		CO1 (A1)				
Procedural Knowledge			CO2(A3) CO3(A3) CO4(A3) CO5(A3)	CO2(A2) CO3(A2) CO4(A2) CO5(A2)	CO2(A4) CO3(A4) CO4(A4) CO5(A4)	
Meta Cognitive Knowledge						

Learning and teaching activities

Classroom Lectures, Application cases, Demonstration, Lab Sessions

Teaching and learning resources

Computer Lab, C++ Editor and Compiler, Textbooks, Ebooks, Reference Materials, Web resources

CO PO Mapping

This is to map the level of relevance of the Course Outcome (CO) with Programme Outcome (PO).

0= No Relevance; 1= Low Relevance; 2= Medium Relevance; 3= High Relevance

CO PO Mapping	PO1	PO2	PO3	PO4	PO5	PO6	Sum
CO1	0	1	2	1	1	3	8
CO2	0	1	2	1	1	3	8
CO3	0	1	2	1	1	3	8

CO4	**0**	**1**	**2**	**1**	**1**	**3**	**8**
CO5	**0**	**1**	**2**	**1**	**1**	**3**	**8**
Target Level Max.	**0**	**5**	**10**	**5**	**5**	**15**	**40**

Program Outcomes

1	Ability to understand the business problems with their knowledge in different functional areas of management.
2	Integrate with structured, semi – structured and unstructured data.
3	Utilize the tools such as Microsoft Excel, SPSS, R, Weka and Tableau to solve business analytics problems.
4	**A**bility to apply analytics techniques to analyze and interpret the data.
5	Incorporate the descriptive, predictive and prescriptive analytics.
6	Evaluate the necessary skills and understanding to take up advanced topics in the area of analytics and thus enhance their career prospects.