LESSON PLAN 2023 (WINTER) classes from 1/08/2023

Discipline: Information Technology	Semester :3rd	Name of the Teaching faculty: Manalisa Giri	Remark
Subject: Data structure	No.of Days/per week class allotted : 04	Semester from date: 1/08/2023 to 30/11/2023 No. of weeks: 15	
Week	Class Day	Theory / Practical Topics	
1st	1st	Concepts on Data, information. Data types Primitive and non-primitive data types. Definition of data structure, Difference between data structure and storage structure	
	2nd	Linear and Nonlinear data structure Data information data types .	
2nd	1st	Data structure operations, Create, Destroy, inserting, Traversing , deleting, Sorting, searching, copy, Concatenation ,	
	2nd	Difference between Abstract Data Type (ADT) and simple data type	
	3rd	operation on ADT, Algorithms and their complexities, Difference between Abstract Data Type (ADT)	
	4th	simple data type, operation on ADT, Algorithms and their complexities	
3rd	1st	String, Definition, Basic terminology, character set, empty string, initial, terminal string	
	2nd	Storage structure of string, Fixed length structure, Variable length structure, Linked structure with examples,	
	3rd	Character data type, Variables and Constants with Examples,	
	4th	String Operations concatenation, length, index, substring, Examples of each operation	
4th	1st	Array definition, why Array is needed? Examples of Array Representation of linear array in memory,	
	2nd	Different Operations performed in an Array like Create, Destroy, inserting, deleting, Sorting, searching, copy,	
	3rd	Traversing operation, Algorithm for traversing linear array, one example of traversing	
	4th	Inserting an element to an Array, insert at m^{th} location. deleting element from array,	
5th	1st	Addressing the kth location in one dimension array, Multidimensional array, representation of two-dimensional arrays in memory and their addressing in row major and column major, Pointers and Pointer Arrays, Concepts of Sparse matrices and its representation.	
	2nd	Definition of STACK, Stack LIFO/FILO scheduling, Basic concepts of Queue, Examples to illustrate their working principle, Array representation of stack, PUSH and POP	

		operations write Algorithms for inserting and deleting element in a stack.	
	3rd	Application of Stack: Evaluation of Expression, Conversion of expression, Recursion, Function call, Back tracking, Arithmetic Expression, Levels of precedence of arithmetic operators, Types of notation of expression i.e prefix, postfix and infix representation	
	4th	Different expression and their conversion. Suitable examples, Algorithm to Evaluate postfix expression by using stack and find VALUE, Polish notation, Transformation of Infix Expression into Post fix Expression, An Algorithm for the same, Suitable Example to show the application of stack	
6th	1st	Definition of Queue and its representation, insert and delete operation circular queue with Examples,	
	2nd	Priority queue, One way List Representation and Array representation of priority queue.	
	3rd	Introduction to linked list, Basic Concepts, Advantages of Linked list in comparison to other data structure.	
	4th	Representation of linked list in memory, Explain with diagram,	
7th	1st	Definition of traversing operation, Algorithm for Traversing a linked list	
	2nd	**Concept on searching,** Algorithm for Searching a node in linked list, Suitable example of the algorithm	
	3rd	Concept of Memory Allocation and Garbage collection, basics of availability list, Insertion and deletion operation into the availability list, Suitable diagram	
	4th	Concept of Overflow and underflow concepts in Availability list, Algorithm for inserting an element at the beginning of the list and at the End, Suitable diagram	
8th	1st	Algorithm for deletion of an element from a linked list. Suitable diagram to show the deletion operation.	
	2nd	Header linked list, Grounded header and Circular header linked list, Suitable diagram to show it. Operations on header linked list Traversing, Search (Basic concepts)	
	3rd	Nonlinear data structure, graph, tree, files, TREE Basic terminology, Root node, leaf node,	
	4th	Definition of Binary tree, Basic features of binary tree, degree, level, height, predecessor, successor, representation of algebraic expression by binary tree.	
9th	1st	Representation of binary tree in memory. Linked representation and Sequential representation (diagram)	
	2nd	Tree traversal, Types of traversals In order, Pre order, & post order traversal , Examples of tree traversal,	
	3rd	Recursive algorithms for Preorder, Inorder and Postorder traversal	
	4th	Binary Search tree, Difference between binary tree and binary search tree	

			creation of a binary search tree ,searching an element in a binary search tree	
	2nd		Insertion and deletion in binary search tree., Give examples for both operations	
	3rd		Definition of Graph, Graph Terminology, Vertices and Edges, representation of graph and Multi graph	
	4th		Multiple edges, Degree, Path, Loop, Cycle, Connected graph	
11th	1st		**Directed Graph, different terminology of graph, out degree, in degree of a node, path, simple path and cycle, strongly connected graph, suitable example**	
	2nd		Definition of adjacency matrix , draw a graph to create a adjacency matrix,	
	3rd		Definition of path matrix, , Examples to find adjacency matrix and to calculate Path matrix with a suitable example	
	4th		Linked representation of graph, take a suitable example, Applications of Graph	
12th	1st		Definition of Sorting and Searching Flow chart and Algorithm concepts, different examples of sorting	
	2nd		Algorithm for Bubble sort, example to demonstrate the technique	
	3rd		Algorithm for Quick sort, example to demonstrate the technique	
	4th		Concepts on Merging, example for two-way merging, Algorithm for merge sort.	
13th	1st		Suitable examples of all sorting techniques, complexities of different sorting techniques	
	2nd		Definition of Searching. Suitable techniques of searching, Examples to demonstrate searching	
	3rd		Algorithm for Linear search, example to demonstrate the technique with its complexities	
	4th		Algorithm for Binary search, example to demonstrate the technique with its complexities.	
14th	1st		Definition of File , Records, fields, Files Types, master, transaction, report, input, output	
	2nd		File organisation - Sequential, indexed sequential,	
	3rd		Random /Relative file organisation, storing techniques	
	4th		Accessing techniques, Sequential and Direct Access, Advantages and disadvantages of access technique	
15th	1st		Definition of Hashing, Hash Table, Hashing functions ,	
	2nd		Division method, Mid square method, Folding, Digital analysis, length dependent	
	3rd		Definition of Collision, Why collision occurs, Collision Resolution Techniques,	
	4th		Open Addressing, Linear Probing and Chaining	

29/7/23

Signature of faculty