ACADEMIC CURRICULUM PLAN

LESSON PLAN 2022.(WINTER) classes from 15/09/2022

Discipline: Information Technology	Semester :3rd	Name of the Teaching faculty: Manalisa Giri	Remark
Subject: Data structure Week	No.of Days/per week class allotted : 04 Class Day	Semester from date: 15/09/2022 to 22/12/2022 No. of weeks: 15 Theory / Practical Topics	
1st (15Sep2022-17Sep2022)	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 Data structure operations, Create, Destroy, inserting, Traversing , deleting, Sorting, searching, copy, Concatenation ,	
2nd (19Sep2022-24Sep2022)	1st	Difference between Abstract Data Type (ADT) and simple data type, operation on ADT, Algorithms and their complexities, Difference between Abstract Data Type (ADT) and simple data type, operation on ADT, Algorithms and their complexities	
	2nd	String, Definition, Basic terminology, character set, empty string, initial, terminal string ,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.	
3rd (26Sep2022-01Oct2022)	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,	
4th (03Oct2022-08Oct2022)	1st	**Puja Vacation**	
	2nd		
	3rd		
	4th		

(10Oct2022-15Oct2022)	1st	Addressing the k[th] 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 (17Oct2022-22Oct2022)	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 (25Oct2022-29Oct2022)	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 (31Oct2022-05Nov2022)	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 (07Nov2022-12Nov2022)	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,	
10th (14Nov2022-19Nov2022)	1st	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 (21Nov2022-26Nov 2022)	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 (28Nov2022-03Dec2022)	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 (05Dec2022-10Dec2022)	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 (12Dec2022-17Dec2022)	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 (19Dec2022-22Dec2022)	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	

15/9/22

Signature of faculty