ACADEMIC CURRICULUM PLAN

LESSON PLAN 2021 (WINTER) classes from 1/10/2021

Discipline: Information Technology	**Semester :3rd**	**Name of the Teaching faculty: Swetalina Das**	**Remark**
Subject: Data structure Week	**No.of Days/per week class allotted : 04** Class Day	**Semester from date: 1/10/2021 to 8/1/2022** **No. of weeks: 15** 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	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		**Puja Vacation**	
4th	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		

5th	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,	
6th	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	
7th	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.	
8th	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,	
9th	1st	creation of a binary search tree ,searching an element in a binary search tree	
	2nd	**I**nsertion 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	
10th	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,	
11th	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.	
12th	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.	
13TH	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	
14th	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	
15TH	IST	REVISION/TEST	
	2ND	REVISION/TEST	
	3RD	REVISION/TEST	
	4TH	REVISION/TEST	

Signature of faculty