



KALINGA INSTITUTE OF INDUSTRIAL TECHNOLOGY
Deemed to be University
BHUBANESWAR-751024

School of Computer Engineering
Autumn Semester 2021-22
Lesson plan and Day wise Coverage

1. **Course code** : CS 2001
2. **Course Title** : Data Structure and Algorithm
3. **LTP Structure** :

L	T	P	Total	Credit
3	1	0	4	4

4. **Course Coordinator** : Mrs. Suchismita Das
5. **Base-lined date** : 26/07/2021
6. **Course offered to the School** : Computer Engineering, Electronic and Electrical Engineering

The day-wise course coverage depicts the provisional date of covering individual topics of the DS&A subject in the academic session of Autumn 2019-2020 .

Lecture No.	Unit	Topics	Lesson #
1-4	Introduction	<ul style="list-style-type: none"> • Introduction • Course Coverage 	Day-1
		<ul style="list-style-type: none"> • Structure, Union • Pointers and Dynamic Memory Allocation (DMA) 	Day-2
		<ul style="list-style-type: none"> • Algorithm Specification • Algorithm Analysis 	Day-3
		<ul style="list-style-type: none"> • Time Complexity • Space Complexity • Class Work 	Day-4
5-9	Arrays	<ul style="list-style-type: none"> • Array Introduction • Row major order and address calculation • Pointers to array, Pointer to structure, Array of pointers 	Day-5
		<ul style="list-style-type: none"> • Difference between static and dynamic memory allocation • DMA – 1-D and 2-D arrays • Problem Solving • Array abstract data type (ADT) • Problem Solving 	Day-6
		<ul style="list-style-type: none"> • Polynomial & its Operation • Matrix Operation 	Day-7
		<ul style="list-style-type: none"> • Sparse Matrix and its Operation • Class Work 	Day-8
		Tutorial Class	Day-9
10-17	Linked List	<ul style="list-style-type: none"> • Introduction to Linked List • Advantages, Disadvantages, Application • Types of Linked List • Representation • Class Work 	Day- 10
		<ul style="list-style-type: none"> • Single Linked List Operation – Traversal, Insertion, Deletion, Insert Last, Delete Last • Class Work 	Day-11
		<ul style="list-style-type: none"> • Double Linked List Operations • Class Work 	Day-12

Lecture No.	Unit	Topics	Lesson #
		<ul style="list-style-type: none"> • Circular Linked List Operations • Class Work 	Day-13
		<ul style="list-style-type: none"> • Header Linked List & operation • Circular Header Linked List & operation 	Day-14
		<ul style="list-style-type: none"> • Polynomial • Double Linked List & operation 	Day-15
		<ul style="list-style-type: none"> • Sparse Matrix • Class Work 	Day-16
		• Tutorial Class	Day-17
18-25	Stacks & Queues	<ul style="list-style-type: none"> • Introduction to Stack • Stack Application • Stack Representation – Arrays 	Day-18
		<ul style="list-style-type: none"> • Stack Representation – Linked List • Stack ADT 	Day-19
		<ul style="list-style-type: none"> • Arithmetic Expression Evaluation • Class Work 	Day-20
		<ul style="list-style-type: none"> • Arithmetic Expression Conversion • Class Work 	Day-21
		<ul style="list-style-type: none"> • Introduction to Queues • Queues Application • Queues Representation – Arrays 	Day-22
		<ul style="list-style-type: none"> • Queues Representation – Linked List • Queues ADT • Class Work 	Day-23
		MID TERM EXAMINATION	
		<ul style="list-style-type: none"> • Linear Queue Drawback • Circular Queues 	Day-24
		<ul style="list-style-type: none"> • Deques • Priority Queue • Class Work 	Day-25
26-37	Trees	<ul style="list-style-type: none"> • Introduction to Trees • Trees Terminology • Class Work 	Day-26
		<ul style="list-style-type: none"> • Tree Application • Binary Tree – Full, Complete and Extended Binary Trees • Expression Trees • Class Work 	Day-27
		<ul style="list-style-type: none"> • Representation of Binary Tree – Linked and Array Representation • Binary Tree ADT 	Day-28
		<ul style="list-style-type: none"> • Arithmetic Expression Conversion • Class Work 	Day-29
		<ul style="list-style-type: none"> • Binary Tree Traversal Concept and Algorithm – In-Order, Pre- Order and Post-Order & Level- Order • Binary Tree Construction with 	Day-30
Lecture No.	Unit	Topics	Lesson #
		different traversal	
		• Class Work on Binary Tree	Day-31

		<ul style="list-style-type: none"> • Threaded Binary Tree – Single and Double Threaded 	
		<ul style="list-style-type: none"> • Binary Search Tree • BST ADT – Search, insertion 	Day-32
		<ul style="list-style-type: none"> • BST ADT – Deletion, • Class Work 	Day-33
		<ul style="list-style-type: none"> • Balanced Binary Tree • AVL Tree • AVL Rotation Techniques, ADT 	Day-34
		<ul style="list-style-type: none"> • Multi-way Search Tree & ADT • B-Tree & ADT 	Day-35
		<ul style="list-style-type: none"> • B+ Tree Introduction • Forest 	Day-36
		<ul style="list-style-type: none"> • Tutorial Class 	Day-37
38-40	Graphs	<ul style="list-style-type: none"> • Introduction to Graph • Graph Terminology • Graph Application 	Day-38
		<ul style="list-style-type: none"> • Graph Representation • Class Work 	Day-39
		<ul style="list-style-type: none"> • Graph Operation – DFS and BFS • Class Work 	Day-40
41-43	Sorting	<ul style="list-style-type: none"> • Bubble Sort • Insertion Sort • Selection Sort 	Day-41
		<ul style="list-style-type: none"> • Quick Sort • Merge Sort 	Day-42
		<ul style="list-style-type: none"> • Heap Sort • Radix Sort 	Day-43
44-47	Searching	<ul style="list-style-type: none"> • Linear Search • Binary Search 	Day-44
		<ul style="list-style-type: none"> • Hashing – Hash Function • Class Work 	Day-45
		<ul style="list-style-type: none"> • Hashing – Collision Resolution Technique • Class Work 	Day-46
		<ul style="list-style-type: none"> • Tutorial Class 	Day-47

Activity Calender

Considering the guidelines circulated, the faculty members are requested to follow activity based teaching and learning proposal. The activity calender is prepared tentatively as follows. Five activity must be performed at least by each and every faculty. You can also conduct more activity as per your convenient.

All the activity marks are to be uploaded in the LMS (google classroom /Moodle) with access to student to

see their performance.

There must be re-test or defaulter test or any other way to provide the scope to the students to improve their performance before final submission of the marks.

<u>Activity</u>	Duration of conducting activity(tentative)	marks should be announced within one week of completion of activity
Activity 1 (Quiz-1)	15 th August to 22 nd August 2021	
Activity 2 (Assignment -1 on critical thinking)	Before mid semester	
Activity 3 (Quiz-2)	22 nd Oct. to 29 th Oct. 2021	
Activity 4 (Assignment -2 on critical thinking)	Before End semester	
Activity 5 (Mini Project)	8 th Nov. To 12 th Nov. 2021	