

# **Teaching Plan**

## **AY 2022-23**

# **Design and Analysis of Algorithms**



## PRIYADARSHINI INSTITUTE OF SCIENCE AND TECHNOLOGY FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to JNTUH Hyderabad)

SatPrabhath Nagar, Khammam Rural -507003, Khammam Dist., Telangana State.

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### TEACHING PLAN

**Name of the Faculty:** Dr. P. Sunil Gavaskar

**Subject Code:**CS603PC

**Subject Name:** Design Analysis and Algorithms

**Academic Year:** 2022-23

**B.Tech III Year II Sem**

S.NO	Unit	TOPIC	Number of Sessions Planned	Teaching method/Aids	REFERENCE
1.	I	Introduction to Algorithms, specification of Algorithms	1	Chalk and Talk	T1, R1
2.		Pseudo code	1	Chalk and Talk	T1, R1
3.		Recursive Algorithms	1	Chalk and Talk	T1, R1
4.		Performance Analysis-Space complexity	1	Chalk and Talk	T1, R1
5.		Tutorial1( Time Complexity)	1	Chalk and Talk	T1, R1
6.		Time Complexity using global method	1	Chalk and Talk	T1, R1
7.		Time complexity using step count method	1	Chalk and Talk	T1, R1
8.		Asymptotic Notations	1	Chalk and Talk	T1, R1
9.		Randomized Algorithms	1	Chalk and Talk	T1, R1
10.		Tutorial2(Quick sort)	1	Chalk and Talk	T1, R1
11.		Divide and conquer general method	1	Chalk and Talk	T1, R1
12.		Recurrence relations	1	Chalk and Talk	T1, R1
13.		Binary search using divide and conquer	1	Chalk and Talk	T1, R1
14.		Quick Sort using Divide and Conquer	1	Chalk and Talk	T1, R1
15.		Tutorial3(Strassen matrix multiplication)	1	Chalk and Talk	T1, R1
16.		Merge sort using Divide and Conquer	1	Chalk and Talk	T1, R1





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17.		Strassen's matrix multiplication using Divide and Conquer	2	Chalk and Talk	T1, R1
18.		Disjoint sets and its operations union and find Algorithms	1	Chalk and Talk	T1, R1
19.		Weighted union and collapsing find operations	1	Chalk and Talk	T1, R1
20.		Articulation point	1	Chalk and Talk	T1, R1
21.		Biconnected components	1	Chalk and Talk	T1, R1
22.	II	Tutorial4 (Backtracking General method)	1	Chalk and Talk	T1, R1
23.		Hamiltonian cycle)	1	Chalk and Talk	T1, R1
24.		8-Queens problem	1	Chalk and Talk	T1, W1
25.		Tutorial 5(Sum of subsets problem)	2	Chalk and Talk	T1, R1
26.		Graph coloring problem	1	Chalk and Talk	T1, R1
27.		Hamiltonian circuit problem	2	Chalk and Talk	T1, R1
28.		Greedy method introduction	1	Chalk and Talk	T1, R1
29.		Optimal binary search trees	2	Chalk and Talk	T1, R1
30.		Tutorial 6(Knapsack problem)	1	Chalk and Talk	T1, W2
31.	III	Knapsack problem	2	Chalk and Talk	T1, R1
32.		All pairs shortest path problem	2	Chalk and Talk	T1, R1
33.		Travelling sales person problem	2	Chalk and Talk	T1, R1
34.		Reliability design	2	Chalk and Talk	T1, R1
35.		Tutorial 7(Single source shortest path)	1	Chalk and Talk	T1, R1
36.		Greedy method:General method	1	Chalk and Talk	T1, R1
37.		Job sequencing with dead lines	2	Chalk and Talk	T1, R1
38.		Knapsack problem	2	Chalk and Talk	T1, R1







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39.	IV	Minimum cost spanning trees	2	Chalk and Talk	T1, R1
40.		Tutorial 8( Optimal binary search tree)	1	Chalk and Talk	T1, R1
41.		Single source shortest path problem	2	Chalk and Talk	T1, R1
42.	V	Branch and bound introduction and general method	1	Chalk and Talk	T2, R1
43.		Travelling sales person problem	1	Chalk and Talk	T2, R1
44.		0/1 knapsack problem-LC Branch and bound	2	Chalk and Talk	T2, R1
45.		Tutorial 9(0/1 knapsack using LCBB)	2	Chalk and Talk	T2, R1
46.		0/1 knapsack problem-FIFO Branch and bound	2	Chalk and Talk	T2, R1
47.		Travelling sales person problem-row and column minimization	2	Chalk and Talk	T2, R1
48.		Travelling sales person problem-Full and dynamic reduction	1	Chalk and Talk	T2, R1
49.		NP hard and NP complete problems- Basic concepts	1	Chalk and Talk	T2, R1
50.		Non-deterministic algorithms	1	Chalk and Talk	T2, R1
51.		NP hard and NP complete	2	Chalk and Talk	T1, R2
52.		Proving NP hard problems	1	Chalk and Talk	T2, R2
53.		Proving NP complete problems	1	Chalk and Talk	T2, R2
54.		Properties of NP complete and NP had problems	1	Chalk and Talk	T2, R2
55.		Cook's theorem	1	Chalk and Talk	T2, R2

### TEXT BOOKS

1. Fundamentals of computer algorithms, 2<sup>nd</sup> edition, EllisHorowitz, Sartaj Sahni and S. Rajascharen, University press.
2. Design and Analysis of Algorithms, P.H.Dave, 2<sup>nd</sup> Edition, pearson Education



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### **REFERENCE BOOKS**

1. Algorithm Design: Foundations, Analysis and Internet examples, M.T. Goodrich and R. Tomassia, John Wiley and sons.
2. Design and Analysis of Algorithms, S. Sridhar, Oxford Univ. Press

### **WEB REFERENCES**

1. [https://www.tutorialspoint.com/design\\_and\\_analysis\\_of\\_algorithms/index.htm](https://www.tutorialspoint.com/design_and_analysis_of_algorithms/index.htm)
2. <https://www.geeksforgeeks.org/fundamentals-of-algorithms/>



  
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