1.	Title of the course	Design and Analysis of Algorithms
2.	Course number	CS304L
3.	Structure of credits	3-0-0-3
4.	Offered to	UG
5.	New course/modification to	Modification To CS3101/8
6.	To be offered by	Department of Computer Science and Engineering
7.	To take effect from	July 2022
8.	Prerequisite	Nil
9.	**Course Objective(s):** To solve computational problems using different algorithmic paradigms in a systematic way; In each paradigm, the emphasis is on proof of correctness and computational complexity of algorithms.	
10.	**Course Content:** Problem-solving and algorithmic thinking; Running time analysis: asymptotic notation, worst case running time, recurrence trees, repeated substitution, substitution method and Master's theorem; Algorithmic paradigms: incremental design, decremental design, divide and conquer, dynamic programming, backtracking, branch and bound; Greedy algorithms: greedy choice, optimal substructure property, fractional knapsack, and Huffman coding; Graph Algorithms: Prim's, Kruskal's, Dijkstra's, Bellman-Ford and Floyd-Warshall algorithms; String matching: BoyerMoore algorithm, Rabin-Karp algorithm; Modular arithmetic algorithms; Hashing techniques; NP-completeness: reduction amongst problems, classes P, NP, NP-hard, NP-complete, and polynomial time reductions.	
11.	**Textbook(s):** 1. Cormen T H, Leiserson C, Rivest R L and Stein C, *Introduction to Algorithms*, 3rd Edition, MIT Press (2009).	
12.	**Reference(s):** 1. Dasgupta S, Papadimitriou C and Vazirani U, *Algorithms*, McGraw-Hill Education (2006). 2. Kleinberg J and Tardos E, *Algorithm Design*, Pearson (2005).	