Course Code	CSE222
Course Name	Algorithm Design & Analysis
Credits	4
Course Offered to	UG/PG
Course Description	This is a follow-up course to DSA (Data Structures and Algorithms) for non-CSE/CSAM students. The focus of this course is to introduce students to design and analysis of algorithms and their proofs of correctness. Students learn fundamental algorithmic design paradigms such as greedy algorithms, dynamic programming, divide and conquer, etc. .

Pre-requisites

Pre-requisite (Mandatory)	Pre-requisite (Desirable)	Pre-requisite(other)
Must have taken data structure and programming	Some knowledge of mathematical proofs	

Post Conditions*(For suggestions on verbs please refer the second sheet)

CO1	CO2	CO3	CO4	CO5
Formally analyze correctness and running time of algorithms	Design and analyze algorithms using strategies like greedy, divide and conquer, dynamic programming etc.	Explain and implement algorithms for sorting , searching and graph problems		

Weekly Lecture Plan

Week Number	Lecture Topic	COs Met	Assignment/Labs/Tutorial
1,2,3	Discrete Math Basics : Induction, Solving recurrences, Introductory graph theory, Introduction to asymptotic analysis,.	CO1	6-8 labs
4	Intro to algorithms and analysis : Karatsuba's Multiplication, Binary Search analysis using recurrence	CO1	5-6 assignments
5,6	Divide and conquer: Introduction, Merge Sort, Quicksort , median finding algorithm	CO2, CO3	4 quizzes
7,8	Graph algorithms: BFS, DFS, Strongly connected components	CO2, CO3	12 tutorials
9,10	Greedy algoirthms for Graph Problems ; minimum spanning trees - Kruskal, Shortest Path (Dijkstra)	CO2, CO3	

11,12	Dynamic programming: Fibonacci, chain matrix multiplication, 0/1 knapsack problem, sequence alignment, Bellman Ford	CO1, CO2
13	Time kept for quizzes	

Assessment Plan

Type of Evaluation	% Contribution in Grade
Assignment	5
Laboratory	10
Quiz	10
Mid-sem	30
End-sem	45

*Please insert more row for other type of Evaluation

Resource Material

Type	Title
Textbook	Fundamentals of Algorithms, Brassard-Bretley