

Course Code	CSE525
Course Name	Graduate Algorithms
Credits	4
Course Offered to	PG
Course Description	This course is an advanced form of an introductory algorithms course, and is meant to have a thorough grounding in core Algorithms required for pursuing PG degree in Computer Science. The course covers topics such as asymptotic notation, recurrence relation, graph algorithms, heaps, dynamic programming, greedy algorithms, divide and conquer, NP-completeness where the UG contents of each topic is first reviewed in a fast-paced manner, and is followed by some advanced content.

Pre-requisites

Pre-requisite (Mandatory)	Pre-requisite (Desirable)	Pre-requisite(other)
Undergraduate Algorithms		

*Please insert more rows if required

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

CO1	CO2	CO3	CO4
Students are able to design and analyse algorithms using techniques like divide and conquer, greedy and dynamic programming.	Students are able to use standard data structures like heaps, trees and graphs for designing algorithms.	Students are able to prove NP-completeness of problems using reductions.	Students are able to state modern techniques to handle intractable problems like randomization, approximation, backtracking search.

Weekly Lecture Plan

Week Number	Lecture Topic	COs Met	Assignment/Labs/Tutorial
1	Review: Discrete mathematics	CO1	
2	Data structures: Heap, Hash table, Disjoint-set	CO2	
3	Greedy Algorithm	CO1	
4	Divide and conquer	CO1	
5	Dynamic programming	CO1	
6	Dynamic programming	CO1	
7	Graph Algorithms	CO1	
8	NP-completeness	CO3	
9	NP-completeness	CO3	
10	Modern techniques for intracatable problems	CO4	
11	Modern techniques for intracatable problems	CO4	
12	Review of previous topics		
13	Review of previous topics		

*Please insert more rows if required

Weekly Lab Plan

Week Number	Laboratory Exercise	COs Met	Platform (Hardware/Software)

*Please insert more rows if required

Assessment Plan	
Type of Evaluation	% Contribution in Grade
Lecture short quizzes	10
Tests	20
Mid-sem exam	30
Final exam	40

*Please insert more row for other type of Evaluation

Resource Material	
Type	Title
Textbook	Fundamentals of Algorithmics by Gilles Brassard & Paul Bratley (PHI)
Reference book	Introduction to Algorithms by Charles E. Leiserson, Clifford Stein, Ronald Rivest, and Thomas H. Cormen (MIT Press)