Course Type	Course Code	Name of Course	L	T	P	Credit
DP3	CSC210	**Algorithm Design & Analysis Lab**	0	0	2	2

Course Objective
To provide practical knowledge about algorithms, algorithm paradigms, and measurement of space and time complexity.
Learning Outcomes
Enhance the ability to implement different algorithm design paradigms and their respective space and time complexity analysis.

Unit No.	Topics to be Covered	Lab Hours	Learning Outcome
1	Fundamentals of Algorithms and Complexity Analysis.	2	Develop the ability to design the algorithm for unseen problems. Ability to write the algorithms in easy to code manner. Students will learn to develop algorithms which are efficient in terms of time and space.
2	Divide-and Conquer Paradigm: Problems on Recurrence Relations, Order Statistics, and Strassen's Matrix Multiplication.	6	Develop the ability to solve different divide-and-conquer problems.
3	Greedy Algorithms: Problems on Knapsack Problem, Tree Vertex Splitting, Job Sequencing with Deadlines, Activity Selection Problem, Minimum Cost Spanning Trees, Optimal Storage on Tapes, Optimal Merge Patterns, and Single-Source Shortest Paths.	8	Enhance the ability to solve different problems solved by greedy method.
4	Dynamic Programming: Problems on Multistage Graphs, Matrix Chain Multiplication, Single-Source and All-Pairs Shortest Paths, Traveling Salesperson Problem, and Longest Common Subsequence.	8	Develop the ability to solve dynamic programming problems and its advantage over divide-and-conquer strategy.
5	Back Tracking: Problems on 8-Queens Problem, Graph Coloring, and Hamiltonian Cycles.	2	Enhance the ability to solve different problems solved by backtracking method.
6	Branch-and-Bound: Problems on Least Cost Search, and 15-Puzzle Problem.	2	Develop the ability to solve different branch-and-bound problems.

Text Books:

1. Cormen, Leiserson, Rivest and Stein, Introduction to Algorithms, Prentice Hall of India.
2. E. Horowitz, S. Sahni, and S. Rajasekaran, Fundamentals of Computer Algorithms, Universities Press.

Reference Books:

1. J. Kleinberg and E. Tardos, Algorithm Design, Pearson Education.
2. M. T. Goodrich and R. Tamassia, Algorithm Design, Wiley Student Edition.