Course Type	Course Code	Name of Course	L	T	P	Credit
DP	**NMCC528**	Design and Analysis of Algorithms Lab	0	0	3	1.5

Course Objective

- To make students have the hands on experience/knowledge of implementing the algorithms based on specific algorithm design methodologies such as the greedy method, divide and conquer, dynamic programming, etc.

Learning Outcomes

- Upon successful completion of this course, students will become a good programmer to implement algorithms of various optimization problems using data structures.

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
1	Introduction to programming platform and basic math programming; Unix kernels and commands, matrix multiplications, complexity of array of numbers, Fibonacci sequence, GCD, floor functions computation and complexity both recursive and iterative	09	This unit will help students to learn the use of Unix platform and the implementation of standard mathematical functions
2	Sorting algorithms and complexity: Comparison, Radix, Bubble, Merge Sorting	06	This unit will make students learn the implementation of several sorting algorithms
3	Dynamic Programming Technique: Longest common subsequence problem, Matrix-chain multiplications	06	This unit will make students learn the implementation of dynamic programming-based algorithms to find LCS and do the matrix multiplications
4	Shortest Path Algorithms: Bellman-Ford algorithm, Floyd-Warshall algorithm	06	This unit will make students learn about the implementation of important shortest path algorithms
5	Minimum Spanning Tree Problems: Kruskal's algorithm, Prim's algorithm and complexity computation	06	This unit will make students learn about the implementation of two of the important algorithms to find the MST.
6	Network and flow problem algorithms: Ford-Fulkerson algorithm	06	Students will learn the implementation of the algorithm to compute the maximum flow in a network.
7	Practice and Review	03	
	Total	**42**	

Text Books

1. T. H. Cormen, C. E. Leiserson, R. L. Rivest, C. Stein: Introduction to algorithms, PHI, 3rd Edition, 2010.

2. A. V. Aho, J. E. Hopcroft, J. D. Ullman, The Design and Analysis of Computer Algorithms, Addison-Wesley, 1st Edition, 1987

Reference Books
1. M. T. Goodrich and R. Tamassia, Algorithm Design, Wiley India, 2010.
2. E. Horowitz, S. Sahni, S. Rajasekaran, The Fundamentals of Computer Algorithms, University Press, 2008.