Course Type	Course Code	Name of Course	L	T	P	Credit
DP	**NMCC512**	Advanced Data Structures and Algorithms Lab	0	0	3	1.5

Course Objective
• To make students have the hands on experience/knowledge of implementing the algorithms based on advanced data structures such as splay trees, binomial heaps, Fibonacci heaps
Learning Outcomes
• Upon successful completion of this course, students will become a good programmer to implement algorithms of various optimization problems using advanced data structures.

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
1	Implementation of randomized quicksort, hashing functions and associated algorithms	06	This unit will help students to learn implementation of quicksort, randomized quicksort and several hashing functions.
2	Implementation of operations on Splay trees and B-trees:	09	This unit will make students learn the implementation of operations on splay trees and B-trees
	Implementation of operations on binary and Fibonnaci Heaps: Operations such as insert, union, decrease-key, make/build heap, delete, findmin	09	This unit will make students learn the implementation of operations on binary, binomial, and Fibonacci heaps
3	Implementation of operations on partition ADT and union find data structurs	06	This unit will make students learn about the implementation of union-find data structures in MST algorithms
4	Implementation of Bellman Ford algorithm	06	This unit will make students learn about about the implementation of Bellman-Ford algorithm.
5	Implementation of Ford-Fulkerson algorithm and Edmond-Karp algorithm	06	Students will learn the implementation of the algorithm to compute the maximum flow in a network and its applications to compute maximum matching
Total		**42**	

Text Books:

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

Reference Books:

1. V. Aho, J. E. Hopcroft, J. D. Ullman, Data Structures and Algorithms, Addison-Wesley, 1st Edition

2. J. Kleinberg, E. Tardos, Algorithm Design, Addison-Wesley, 1st Edition, 2005