

Course Type	Course Code	Name of Course	L	T	P	Credit
DE	NECD553	Design and Analysis of Algorithms	3	0	0	3

Course Objective

Algorithms are essential to the study of computer science and are increasingly important in the natural sciences, social sciences and industry. Learn how to effectively construct and apply techniques for analyzing algorithms including sorting, searching, and selection. Gain an understanding of algorithm design technique and work on algorithms for fundamental graph problems including depth-first search, worst and average case analysis, connected components, and shortest paths.

Learning Outcomes

- To develop the algorithm in every domain
- Understanding the issues of complexities
- To structure the algorithm for better efficiency

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Fundamentals – Growth of functions	08	<ul style="list-style-type: none"> • To understand the fundamentals of algorithm design • Development of functions in algorithms
2	Sorting and searching - Advanced data structures	08	<ul style="list-style-type: none"> • To develop the programming skills • To develop the programs for the implementation of sorting & search techniques and analyzing the complexities • To structure the tasks in implementation of algorithms
3	Graph algorithms - Numerical algorithms	09	<ul style="list-style-type: none"> • To understand the concept of graphs • To design the algorithms on graphs and numerical methods with minimum complexity
4	Distributed algorithms - Computational geometry	09	<ul style="list-style-type: none"> • To get concept of distributed computation • Development of algorithms on distributed algorithms • To get exposure on computational geometry
5	String matching - NP – completeness	08	<ul style="list-style-type: none"> • To understand the concept of string matching • To understand and provide the solution of different problems
Total		42	

Text Books:

1. Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser, “Data Structures and Algorithms in Python”, Wiley Publishers, 2016
2. Jon Kleinberg, Éva Tardos, “Algorithm Tardos”, Pearson Education, 2013

Reference Books:

1. Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein, “Introduction to Algorithms”, Prentice Hall of India, 2010.
2. Anany Lenin, “Introduction to the Design and Analysis of Algorithms”, Pearson Education, 2011.