Course Instructor: Dr Chiranjib Sur

Course Webpage: https://chiranjibsuruf.github.io/courses/da111.html

Email: chiranjib@iitg.ac.in

Objectives: Algorithm Design & Analysis trains you to solve problems efficiently, choosing the right approach so your solutions scale from small inputs to real-world data sizes. It builds the core thinking behind modern computing: correctness, complexity, and the ability to design smarter systems rather than just write code.

Prerequisites: Data Structure and Basic Programming

Course Code: DA111

Course Name: Algorithm Design & Analysis

Credits: 3-0-0-6

Syllabus: Asymptotic notation, space and time complexity; Sorting and order statistics - linear time sorting, quicksort; Searching; Design and analysis techniques - greedy method, divide-and-conquer, dynamic programming, amortized analysis; Graph algorithms - properties of BFS and DFS, connected components, topological sort, minimum spanning trees, shortest paths, max flow.

Textbooks:

- T. H. Cormen, C. E. Leiserson, R. L. Rivest, and C. Stein, Introduction to Algorithms, Prentice-Hall of India, 2009.
- A. V. Aho, J. E. Hopcroft, and J. D. Ullman, The Design and Analysis of Computer Algorithms, Pearson Education, 2006.

References:

- To be updated.