COT-6405 Analysis of Algorithms

Catalog Description
Design of advanced data structures and algorithms; advanced analysis techniques; lower bound proofs; advanced algorithms for graph, string, geometric, and numerical problems; approximation algorithms; randomized and on-line algorithms. (3 credits)

Prerequisites
SCIS Graduate Standing, esp., Data Structure, Computer Programming, Algebra, Probability Analysis

Type
Required for MSCS
Elective for MSIT, MSTN, and Ph.D. students

Course Objectives
Students will learn both the elementary and advanced techniques for efficient algorithm design along with asymptotic analysis of running time or cost and intractability proof for real problems.

Topics
Introduction: Asymptotic Analysis
Divide-and-Conquer Paradigm & Randomized Algorithms
Sorting Algorithms
Advanced Data Structures
Dynamic Programming, Greedy Algorithms, & Amortized Analysis
Graph Algorithms
String Matching
Geometric Algorithms
NP Completeness
Approximation Algorithms

Textbook
Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein, *Introduction to Algorithms, Third Edition*, (MIT Press, 2009).

Last Update
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