

# CS 535: Design and Analysis of Algorithms

## Objectives

- The course will advance the study of algorithms.
- The study will include techniques of algorithm design and design of data structures for improved complexity bounds.

## Prerequisites

- CS 430.

## Syllabus

- Data Structures for Improved Algorithmic Complexity
  - Heapsort and Heaps
  - Binomial Heaps
  - Fibonacci Heaps
  - Application of these structures to Minimum Spanning Trees
  - Balanced Binary Search Trees, such as Splay Trees
  - Union-Find Data Structure
- Algorithmic Techniques
  - Greedy Algorithms and Matroids
  - Shortest Paths and Dynamic Programming
  - Divide and Conquer
    - Typical examples: Sorting and Order Characteristics.
  - Randomized algorithms such as Treaps
  - Graph algorithms -- Biconnectivity, Strong Connectivity
  - Network Flows and Bipartite Matching
  - NP-Complete problems

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