CISC 3220 [23] Analysis of Algorithms
3 hours; 3 credits


Objectives

Student will be able to:

1. Demonstrate an understanding of the growth of functions, the use of O, Omega and Theta notation, and worst-case and average-case time complexity, and apply the above concepts to analyze the complexity and efficiency of algorithms.
2. Demonstrate knowledge of several algorithms for sorting and order statistics and an understanding of the analysis of their complexities.
3. Demonstrate an understanding of various design techniques such as divide-and-conquer and greedy methods.
4. Demonstrate knowledge of different methods for representing a graph and of basic graph algorithms such as traversals, finding a minimum spanning tree and finding the shortest path.
5. Demonstrate an understanding of the nature of the classes P, NP and NP-complete, and define several problems that belong to these classes.

Textbook


Syllabus

Chapter 1: Analyzing Algorithms
Sections 1.4, 1.5, 1.6
(Read section 1.3 – review of mathematical background)

Chapter 4: Sorting
Sections 4.1 - 4.9

Chapter 3: Recurrence Equations and Recursion Trees
Sections 3.6, 3.7

Chapter 5: Selection
Sections 5.1 - 5.5

Chapter 7: Graphs and Graph Traversals
Bibliography


