Algorithms And Complexity

Syllabus Information

CS 2860 - Algorithms and Complexity

Associated Term: 2022/23 Academic Session
Learning Outcomes

By the end of the course students should be able to:

1. understand and reason about alternative data structure representations, and their use in algorithms;

2. implement and reason about alternative implementations for basic algorithms;

3. calculate the complexity of basic algorithms

Course Summary:

Complexity: counting, big-O notation, best-case, worst-case and average-case analysis.

Basic algorithms: implementation and analysis of linear search, binary search, and basic sorting algorithms, especially insertion sort, selection sort, merge sort, quick sort, heap sort.

Data structures: binary search trees, balanced binary search trees, hash tables, (binary) heaps.

Abstract datatypes: Sets, maps, priority queues.

Basics of graph algorithms: adjacency matrix and adjacency list representations; algorithms for connectivity, shortest paths, and spanning trees.

Required Materials:

Click here for the reading list system

Technical Requirements:

The total number of notional learning hours associated with the course are 150.

These will normally be broken down as follows:

Teaching & Learning Methods:

Lectures - 1 hour three times per week - 11 weeks - 33 hours

Formative Assessment:

In-lecture verbal feedback

Summative Assessment:

Quizzes (150 Minutes) - 10%

Written Assignment (5 Hours) - 10%

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Written exam (2 Hours) - 70%