COMP 3760

Algorithm Design and Analysis

Course Details

- Instructor:
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About Me

- Background
  - Computer Science and Software Engineering(Ph.D, MSc, BSc.)
- Research Area
  - Distributed service scheduling
  - Multi-agent Systems
  - Algorithmic Mechanism Design, Game Theory
  - Wirelesses sensor Networks
- Prior to that… software development

About the Course

- This is a course on *algorithms*
  - Explicit descriptions of procedures to solve problems
- Why we need to study algorithms?
  - Is recognized as the core of computer science
  - To know a standard set of important algorithms
  - Design new algorithms and analyze their efficiency

About the Course

- Algorithms don't change quickly
  - 20 years ago, nobody was learning Java
  - They were learning the same algorithms
  - They are good programmers now

At the end of the course, you should be able to…

- Describe common algorithms
- Analyze pseudo-code using asymptotic notation
- Design algorithms using several techniques e.g. Divide and Conquer, Greedy, Graph techniques, etc
- Implement algorithms in Java
- Recognize different types of problems and how to go about solving them
- Argue the correctness of algorithms

Details

- Textbook
  - “The Design and Analysis of Algorithms,” Levitin In the book store

Details

- Grading:

Criteria	%	Comments
Lab Assignments	25	Weekly assignments, 11 assignments in total
Quizzes	20	Biweekly held in lab, 6 quizzes in total
Midterm Exam	25	
Final Exam	30	
Total	100	

- Note: the passing grade in this course is 50%.

Pre-requisites 1

- Java (Comp 2526)
  - You need to be able to program in Java
    - Used for assignments
    - Used to test algorithm efficiency
  - I am not going to teach you Java
  - You can use any IDE you want
  - You are expected to write “good code” as you learned previously

Pre-requisites 2

- Discrete math (COMP 2121)
  - Parts of this course are theoretical
  - Parts of this course use math
    - Solve polynomial equations
    - Set up and solve summations
    - Work with logarithms
  - I expect you know these things
  - I am happy to review and explain them
    - PLEASE DON'T FALL BEHIND BECAUSE OF BASIC MATH

Pre-Requisites 3

- Not an official pre-req… but C programming is good to know
  - Lots of web resources on algorithms in C
  - Lots of procedural descriptions of algorithms
  - It is useful to understand C when you read it

Course Strategy

- Lectures
  - Focus on one core topic each week
- Labs
  - Reinforce topic through practice
- Homework/reading
  - Is my way of telling you what I think is important
  - You should care about this

Best Student Strategy

- Do practice problems
  - The only way to get good in algorithm design is practice
- Keep up with material
  - It is hard to succeed “cramming” for tests
- If you do the reading/homework:
  - Quizzes and labs will be easy

Labs and Quizzes

- Labs are done in the lab time
  - Practice with problem solving
  - Mandatory attendance
  - Sometimes on paper, sometimes programming
- Quizzes are also done in the lab time
  - 20-30 minutes, individually