CSC-421 Applied Algorithms and Structures (Online)

Spring 2019-2020

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Office Hours via Zoom: Mon 4:45-5:45; Wed 2:00-3:00 & 4:45-5:45
Course Website: https://d2l.depaul.edu/

Course Description

This course covers techniques for designing and analyzing algorithms. Fundamental topics such as running-time analysis and efficiency, and problem-solving techniques (divide-and-conquer, greedy, dynamic programming) will be covered. Examples from various areas, including computational geometry and bioinformatics, will be discussed.

Prerequisites

CSC-400 and CSC-403.

Required Textbook

T. H. Cormen, C. L. Leiserson, R. Rivest, and C. Stein, *Introduction to Algorithms*, **3rd edition**, *The MIT Press*, 2009, **ISBN 978-0262033848**.

You may get an electronic/soft copy or a different version/edition of the textbook. However, be mindful that homework and reading material will be assigned from the textbook. If you obtain a version of the textbook in which the pages do not match those of the required version above, then you are responsible for any issues that may result from this discrepancy (e.g.,

read the wrong material or answered the wrong question, etc.).

Attendance

This course will be conducted online. You will have access to the recording of the lectures on D2L and I will be available to answer your questions via Zoom. Please watch the video accompanying the syllabus regarding the details and logistics.

Grading

- *Homework Assignments — 50 %*

  Assignments are due on the specified due date and time. Late submissions will not be accepted. You should double check your submission on D2L to make sure that you submitted the correct file; **NO** resubmissions due to submitting the incorrect/incomplete file will be accepted.

- *Final Exam — 50%*

  The final exam will be online. It will be on Monday, June 8th, from 5:45-8:45 PM. The final is cumulative. No make-up exams will be given. Specific information about the final exam and its logistics will be communicated at a later time

Topics

1. Review: growth of functions and recurrences, analysis of the running time of algorithms (chapters 1, 2, 3, 4, 33).
2. Divide and conquer (examples from chapters 2, 4, 7, 33).
3. Dynamic programming (chapter 15 and supplementary material).
4. Greedy algorithms (chapters 16, 23, 24).
5. Problem modelling and reductions (time permitting, selection from chapter 26).

Plagiarism

All assignments and the final exam must be done on **YOUR OWN**. You are strictly prohibited from using any source other than the text and the

lecture notes when working on the homework and final exam problems. In particular, you are strictly forbidden from acquiring hints and/or solutions from the internet or from any other external resource or person (besides the instructor). Copying is strictly forbidden. Scholastic dishonesty includes acquiring answers from any unauthorized source, working with another person, observing the work of other students during any exam, providing answers when not specifically authorized to do so, and informing any person of the contents of an exam prior to the exam. Disciplinary actions range from grade penalty to expulsion. Please refer to the school policy on plagiarism for more specific details.

Learning Outcomes

- Students will be able to use basic algorithmic structures for modeling problems in computer science.
- Students will learn basic techniques for designing and analyzing computer algorithms.
- Students will be exposed to a set of fundamental problems that have applications in several areas of computer science.

Students with Disabilities

Students who feel they may need an accommodation based on the impact of a disability should contact the instructor privately to discuss their specific needs. All discussions will remain confidential. To ensure that you receive the most appropriate accommodation based on your needs, contact the instructor as early as possible in the quarter (preferably within the first week of class), and make sure that you have contacted the Center for Students with Disabilities (CSD) at: csd@depaul.edu

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Course Evaluation: School Policy

Course and instructor evaluations are critical for maintaining and improving course quality. Please complete the evaluations at the end of the quarter.