CSC-321 Design and Analysis of Algorithms
Fall 2018-19

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Office Hours: Monday & Wednesday 4:00 - 5:30
Course Website: https://d2l.depaul.edu/

1 Course Description

This course is an introductory course to the design and analysis of algorithms. Fundamental topics such as running-time analysis, searching and sorting, graph algorithms, divide-and-conquer, greedy methods, and dynamic programming will be covered. Applications of these topics to various areas, including computational geometry and bioinformatics, will be discussed.

2 Prerequisites

Math-140 and CSC-301.

3 Required Textbook

R. Johnsonbaugh and M. Schaefer, *Algorithms*, Prentice Hall, 2003. ISBN 0-02-360692-4.

You may get an electronic/soft copy of the textbook (if available), but note that the exams for this course are open book, and electronic devices and internet access are not allowed in the exam (so if you get an electronic copy, you will need to print out the relevant material and bring it to the exam).

Moreover, homework and reading material may/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.).

4 Attendance

Attendance is not mandatory but highly recommended. Students who miss a lecture are responsible for the material covered in the lecture.

5 Grading

- *Homework Assignments — 30 %*

  Assignments are due on the specified due date and time. Late submissions are not accepted.

- *Midterm — 30%*

  The midterm exam is on Monday, October 15^{th}, in class (during class time).

  No make-up exams will be given. The exam is open book. Electronic devices and internet access are not allowed.

- *Final Exam — 40%*

  The final exam is on Wednesday, November 14^{th}, from 11:30 AM -1:45 PM, in class. Note that the exam time is **NOT** the same as the class meeting time (even though it overlaps with it).
  The final is cumulative. No make-up exams will be given. The exam is open book. Electronic devices and internet access are not allowed.

6 Topics

1. Introduction; growth of functions and algorithm analysis; and basic examples of searching and sorting. (Chapters 1, 2.)

2. Divide and conquer. (Chapters 4, 5, 6.)

3. Counting Sort & Radix Sort. (Chapter 6.)
4. Dynamic programming. (Chapter 8.)
5. Greedy algorithms. (Chapter 7.)
6. Graph-search algorithms & their applications (depth-first search, breadth-first search, connectivity, topological sorting, etc.). (Chapter 4.)
7. Other selected topics if time permits.

7 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.

8 Plagiarism

All assignments 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 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 except when permitted by the instructor, 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.

9 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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10 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.