

CSC-321-501 Design and Analysis of Algorithms Winter 2024

Class Meeting Time: Tuesday & Thursday 10:10-11:40

Instructor: Iyad Kanj

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Office Hours (Office/Zoom): Tuesday & Thursday 1:30-3:00

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.

2 Prerequisites

Math-140 and CSC-301.

3 Textbook

Jeff Erickson, *Algorithms*, **1st edition**. Publicly available and can be downloaded from

<https://jeffe.cs.illinois.edu/teaching/algorithms/#book>

High-Production Recorded Materials

Throughout this course, you will be provided with high-production video recordings of the materials that will be covered in this course, as well as the slides accompanying these materials. The high-production videos were pre-recorded at the “light studio” at DePaul and their quality will generally be superior to that of COL recordings. You should note, however, that these

videos were recorded with no audience, and hence, lack student participation.

Attendance

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

Changes to Syllabus

This syllabus is subject to change as necessary during the quarter. If a change occurs, it will be thoroughly addressed during class, posted in D2L and sent via email.

Respect for Diversity and Inclusion

I see diversity as an asset and a strength that adds to the richness of classroom learning. In my course, I strive to include diverse authors, perspectives and teaching pedagogies. I also encourage open dialogue and spaces for students to express their unique identities and perspectives. I am open to having difficult conversations and I will strive to create an inclusive classroom that values all perspectives. If at any time, the classroom experience does not live up to this expectation, please feel free to contact me via email or during office hours.

4 Grading

- *Assignments (5-6 assignments)—30%*

Homework assignments are due on the specified due date and time. Late submissions will not be accepted. Please 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.

- *Midterm Exam—30%*

In-Class Students. The midterm exam is on Thursday, February 8th, from 10:10-11:40 AM (during regular class hours), in class. No

make up exams will be given. The exam is open book. Electronic devices and internet access are not allowed.

Online/ASync Students. You will need to take a proctored exam at an approved testing facility (university, library, etc.) or at CDM; no online exams will be given. You will need to register through MyCDM/D2L to take your proctored exam during a time window that is specified in the registration system; no make-up exams outside of this time window will be given. The duration of the midterm exam is one hour and a half (90 minutes). Please register as soon as possible. The exam is open book. Electronic devices and internet access are not allowed.

- *Final Exam—40%*

In-Class Students. The final exam is on Thursday, March 21st, from 8:30 AM-10:45 AM (in class). Note that the exam time, which is scheduled by the University, does not fall completely during the regular class hours but overlaps with them. No make-up exams will be given. The exam is open book. Electronic devices and internet access are not allowed.

Online/ASync Students. You will need to take a proctored exam at an approved testing facility (university, library, etc.) or at CDM; no online exams will be given. The duration of the exam is two hours and fifteen minutes (135 minutes). You will need to register through MyCDM/D2L to take your proctored exam during a time window that is specified in the registration system; no make-up exams outside of this time window will be given. Please register as soon as possible. The exam is open book. Electronic devices and internet access are not allowed.

5 Topics

1. Review: growth of functions and run-time analysis (sections 0.5 and 0.6).

2. Divide and conquer (chapter 1 and examples from outside the text-book).
3. Dynamic programming (chapter 3).
4. Basic Graph Algorithms (chapters 5 & 6)
5. Greedy algorithms (sections 4.2, 4.3, 4.4, chapter 7 and section 8.6).

6 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.

7 Plagiarism

All the assignments and the exams 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 exams' 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.

8 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

Lewis Center 1420, 25 East Jackson Blvd.

Phone number: (312)362-8002

Fax: (312)362-6544

9 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. There will be a 15-minute break during the class lecture on Thursday, November 9, for in-class students to complete the evaluation.