CECS 328 Syllabus

Darin Goldstein

1 Contact info

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- Office hours: MW 10:50-11:50 AM, 3:20-4:20 PM

- Term: Fall 2021

- Class Meeting Times: MW 9:30-10:45 AM

- Class Location: online

- Textbook: **Introduction to Algorithms** (3rd edition) by Cormen, Leiserson, Rivest, and Stein. Lecture notes are available for free online.

<u>Zoom links</u>: Official Zoom invitations will be sent out via email before the first day of class.

(lecture) https://csulb.zoom.us/j/83801540750?pwd=WEdzQVFYT0hYd3QwS3ZwNjBxcGM2UT09
(early office hour) https://csulb.zoom.us/j/86188533580?pwd=OGViS3FxYXdSYnJMbVByQlArd3hIdz09
(late office hour) https://csulb.zoom.us/j/82616581839?pwd=V0I4T0pKcUtDNWh4cytoV2xTUnF4QT09

2 Objectives

The objective of CECS 328 is to follow up CECS 228. You should already have knowledge of basic data structures and some simple algorithms under your belt. In computer science, there have been major algorithmic advances that are applicable to a wide range of problems. It is the goal of this class to illustrate those methods and then, at the end, prove that there is also a large class of problems that computer scientists believe are intractable.

3   How this course will be graded

There will be weekly quizzes (40%) and 5 programming assignments (12% each).

It is the student's responsibility to notify the instructor in advance (immediately after the first lecture, via email) of any need for accommodation of a disability that has been verified by the University.

4   Lectures

Some good news for this course is that you will never be explicitly penalized for missing a lecture. I will never give any pop-quizzes. All graded material is mentioned explicitly somewhere in this syllabus. The final exam date for this course is set by the University (totally independently of me and over which I have absolutely no control) and should be available via the University website.

On the other hand, this is definitely a lecture-based course. If you choose to miss a lecture, I will not penalize you for it or hold it against you in any way, but you are fully responsible for any material that I go over. If I mention something in lecture that is not in the book, YOU ARE STILL RESPONSIBLE FOR KNOWING IT. I will not redo a lecture for people that missed it the first time. It is your responsibility to get the notes/information. If you miss any kind of instructions about assignments that are given during lecture (including but not limited to due dates, methods for submission for assignments, etc.), it is STILL your responsibility to be aware of what occurred in lecture.

5   Communication

- All communication in this course via email must be via the University's email system. I may not respond to any email that is sent from outside your csulb.edu email address, and all emails to you will be sent from my csulb.edu to your csulb.edu email address.

- All Zoom interaction with students will be recorded. If you are uncomfortable with being recorded, please interact with me via email.

- I reserve all copyrights to all video interactions that we have in this including but not limited to my lectures and office hours. Copyright violations will be pursued by the University legal department.

6   Quizzes

Your grades will be available on Beachboard as soon as possible after grading has been completed.

7 Programming assignments

All programming assignments are to be written in either Java, C++, or Python.

When it comes to questions about the assignment: I will answer any question pertaining to what it is you have to do and no questions about how to do it.

You may not consult with anyone other than me and your textbook about the programming assignments unless otherwise explicitly allowed by me via email. I will never write code for anyone in the class. All coding will be completely left up to you, and you may not use code written by anyone other than you unless authorized by me via email. **IF I FIND OUT THAT COLLABO-RATION OF ANY KIND HAS OCCURRED ON ANY PROGRAM-MING ASSIGNMENT, THE PENALTY IS AN AUTOMATIC F IN THE COURSE FOR ALL PARTIES INVOLVED REGARDLESS OF WHO DID THE ACTUAL WORK.** If there is evidence that either (a) your code is in someone else's possession or (b) someone else's code is in your possession, that is collaboration. If you discuss the programming assignments with anyone other than me at any time, that is collaboration.

This policy will be rigidly enforced. It is your responsibility to make sure that nobody is able to copy your work. I recommend never leaving a public computer unattended, never letting anyone see your code, and always deleting your work from any public computer. (If you need a place to save your work, e-mail it to yourself.) If you suspect that your work is being copied (or cheated off of in any way) by someone else, you may let me know by e-mail BEFORE you turn in the assignment, and I may take it into account. However, I will not take into account statements about cheating that do not explicitly identify the cheating party.

I reserve the right to call anyone into my office hours/lab time for any reason to explain any issues with your source code (e.g. if your code does not produce an answer that you submitted, if your code too closely matches that of someone/somewhere else, etc.). Failure to show up for such a meeting will certainly earn a 0 on the assignment and most likely an F in the course depending on the circumstances (e.g. if I suspect cheating/collaboration is involved). If a student is unable to adequately explain his/her work on a programming assignment, the grade on the assignment may be reduced appropriately.

On the first day of classes, I will explain the submission procedure. You should ask any questions about the process on the first day. It is your responsibility to clear up any misunderstanding with me as soon as possible, either in class or via email. This procedure will be posted on Beachboard in video form in the first lecture. It is the student's responsibility to make sure that the grading platform is accessible and workable to them and to notify me *immediately* if not.

Requests for late submissions will not be entertained. (BMAC accommodations need to be requested *before* the due date and time.)

If you have any questions or comments about the rules, it is your responsibility to let me know about them IMMEDIATELY so that they can be straightened out.

8 Withdrawal policy

The University allows a student to withdraw from a class up until a certain date for a "serious and compelling reason" with a professor's signature. I will sign drop forms that list the following reason: "Inability to complete the coursework." For this course, that will be the instructor's interpretation of a serious and compelling reason.

9 Cheating

Cheating on any graded material in the course will lead to an automatic grade of F in the course. The University Honors committee will also be notified and ejection from the Honors program is possible/probable.

If you receive an F in this course for reasons of cheating, it will be reported to the department and the University as such, and it will be a grade on your transcript that will permanently affect your GPA. (The repeat/delete option will not be available for a grade that is assigned because of a violation of this kind.)

I don't give warnings.

10 Statements

1. The official CSULB Policy on Cheating and Plagiarism can be found here: http://web.csulb.edu/divisions/aa/catalog/current/academic_information/cheating_plagiarism.html

2. Students with a disability or medical restriction who are requesting a classroom accommodation should contact the Disabled Student Services at 562-985-5401 or visit Brotman Hall, Suite 270 during 8AM-5PM weekday hours. Disabled Student Services will work with the student to identify a reasonable accommodation in partnership with appropriate academic offices and medical providers. We encourage students to reach out to DSS as soon as possible.

3. Any student who is facing academic or personal challenges due to difficulty in affording groceries/food and/or lacking a safe and stable living environment is urged to contact the CSULB Student Emergency Intervention and Wellness Program. The website outlining the resources available is www.csulb.edu/basicneeds. Students can also e-mail supportingstudents@csulb.edu or call 562/985.2038. If comfortable, students may reach out to the professor as they may be able to identify additional resources.

4. Title IX prohibits gender discrimination, including sexual harassment and sexual misconduct. If you have experienced sexual harassment, sexual assault, rape, dating/domestic violence, or stalking, the campus confidential Victim's Advocate is available to help. Jaqueline Urtez (e: advocate@csulb.edu, p: (562) 985-2668) can provide free and confidential

support, accommodations, and referrals for victims without having to report the assault to campus authorities. While students are welcome to discuss assaults with faculty, both faculty and teaching assistants are mandatory reporters who are required to report all incidents of sexual harassment/misconduct to the Title IX office for follow-up and possible investigation. Students who do wish to report the assault for possible investigation may contact the confidential victim's advocate, who can help them through the reporting process, or they can report the assault directly to the Title IX Office by completing an online reporting form at https://www.csulb.edu/equity-diversity/title-ix or contacting the Office of Equity & Diversity at OED@csulb.edu.

11 The final word

If there is anything on this page that you have a question or comment about, it is very important to let me know about it on the FIRST DAY OF CLASSES. After the first day of classes, I will assume that you are aware of the grading policies. Any grading misunderstandings you have after the first day of classes are your responsibility. Good luck.

12 Course topics

1. Asymptotics

2. Master Method

3. Introduction to Recursion

4. Lower bounds

5. Divide and conquer: Strassen's algorithm

6. Divide and conquer: FFT I

7. Divide and conquer: FFT II

8. Divide and conquer: deterministic order selection

9. Dynamic programming I

10. Dynamic programming II

11. Dynamic programming: APSP

12. Introduction to Greedy

13. Greedy: MST (Kruskal/Prim)

14. Greedy: Huffman coding

15. Graph Algorithms: DFS

16. Graph Algorithms: DFS applications

17. Graph Algorithms: Eulerian graphs

18. Hybrid (greedy/dynamic programming): Directed Chinese postman problem

19. Linear programming: Simplex

20. Network flow

21. Network flow applications

22. Circulation applications

23. Introduction to P/NP

24. P/NP: Simple NPC proofs

25. P/NP: Path NPC proofs

26. Introduction to Approximations

27. Case study: 0-1 knapsack problem

28. Case study: Bin packing