



California State University, Sacramento
College of Engineering and Computer Science

Computer Science 130: Data Structures and Algorithm Analysis

Summer 2024 Syllabus

Instructor

Devin Cook, M.S.

Contact Information

I use the same e-mail address to answer questions and to receive your coursework. So, please use a descriptive subject in your e-mail. I get quite a bit of e-mail, and the subject helps a lot.

E-Mail	dcook@csus.edu
Office	Riverside Hall 5009
Zoom #	331 390 3761

Website

All the information in this syllabus – as well as other helpful information presented during the course – can be found online.

Website	athena.ecs.csus.edu/~dcook/130
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Course Description

Catalog Description

Specification, implementation, and manipulation of complex data structures: multi-lists, trees, sets, and graphs. Design and analysis of algorithms. Recursion and stack-based memory management. Advanced searching and sorting. NP completeness

Prerequisites

- CSc 20
- CSc 28 (may be taken concurrently)

Textbook (optional, not required)

Robert Sedgewick and Kevin Wayne; Algorithms 4th Edition; Course Technology

Major Topics

- Design, representation and implementation of data structures
- Algorithm analysis and design: Big-O notation; time requirement; space requirement; counting techniques
- Linear lists and multilists: application of stacks and queues, priority queues
- Trees: binary and n-ary trees; traversals; threaded trees; heaps; binary search trees, AVL trees, B-trees, and general search trees
- Sets and their representation: bit map, hash table, union-find
- Graphs: traversals; spanning trees; shortest paths
- Recursion and stack-based memory management
- Advanced sorting: heapsort, mergesort radix sort; comparison with other sort algorithms
- Problem space searching: BFS and DFS
- NP-completeness

Crashing the Course

- **All** student adds are done, in-person, during the second week of the Semester.
- Waitlisted students will be added first. But, only students physically present will be added.

Academic Integrity

- Do **not** plagiarize. Plagiarism is the act of incorporating another person's work into yours and claiming it as your own.
- Do **not** aid any student to commit academic fraud. This means you **cannot** show your solution to another student or show how to do it.
- Do **not** use Discord for any channel related to the course. This will be considered cheating.
- In **any** case of cheating, both the student that copied the solution, **and** the student who allowed it, will receive a zero. For severe incidents, it will result in an automatic **F** in the course.
- Any assignments done in prior semesters, *even if you took this class*, are **not** allowed. Any prior work will receive an automatic zero.

Lectures

- Attendance is vital to your success in the course. If you miss a class, you are responsible for checking with a classmate about the material we covered.
- Please ask questions or give comments. I enjoy back-and-forth interactions with students.
- During lectures **no** electronic devices, of any type, are allowed. This includes laptops, phones, and other texting devices. **No** exceptions.
- I will provide all the lecture slides in PDF format on the website. So, you don't have to take notes.

Assignments

- You only get to submit each assignment **once** – so make sure you did it correctly!
- Late assignments are penalized. I will take off **20%**, per day, starting immediately after the assignment is due. Weekend days are counted.
- **Do not ask other students for help.** All assignments are individual work only.
- My job is not to give you the correct solution, but to help you figure it out by yourself. There are no "dumb" questions, so don't be afraid to ask.

Grading

Title	Percent
Projects	300
Midterm Exam	300
Final Exam	300
	900

- The Final is comprehensive.
- Any material covered in the lectures, or the notes can be included in the exams.
- **Note:** Depending on how much material is covered during the semester, the percentages may vary.

Student Resources

- **Student Health & Counseling Services**
www.csus.edu/student-life/health-counseling
- **Crisis Assistance & Resource Education Support**
www.csus.edu/student-affairs/crisis-assistance-resource-education-support/
- **Reading and Writing Center**
www.csus.edu/undergraduate-studies/writing-program
- **Services for Students with Disabilities**
www.csus.edu/student-affairs/centers-programs/disability-access-center