



California State University, Sacramento
College of Engineering and Computer Science

Computer Science 130: Data Structures and Algorithm Analysis

Fall 2021 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	devincook.com/csc/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)

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

Topics Covered

- Design, representation and implementation of data structures
- Algorithm analysis and design: Big-O notation; time requirement; space requirement; counting techniques (4 hours).
- 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, treesort, radix sort; comparison with other sort algorithms
- Problem space searching: BFS and DFS
- NP-completeness

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.
- Any assignments done in prior semesters, *even if you took this class*, are **not** allowed. Any prior work will receive an automatic zero
- **All** work is considered individual work unless explicitly stated otherwise.
- 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. I might have to notify the College.

Lectures

- Attendance is vital to your success in the course. If miss a class, you are responsible for checking with a classmate about the material we covered
- I will provide all the lecture slides in PDF format on the website. So, you don't have to take notes.
- Please ask questions or give comments. I enjoy back-and-forth interactions with students. There are no dumb questions!

Assignments

- .You only get to submit each assignment **once** – so make sure you did it correctly!
- 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. But, don't be upset if I don't give an answer!
- Late assignments are penalized. I will take off 10%, per day, starting immediately after the assignment is due. Weekend days are counted.
- Do not ask other students for help.

Grading

Title	Percent
Assignments	20%
Midterm Exams	40%
Final Exam	40%
	100%

- 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**
<https://www.csus.edu/student-life/health-counseling>
- **Crisis Assistance & Resource Education Support (CARES)**
<https://www.csus.edu/student-affairs/crisis-assistance-resource-education-support>
- **Services for Students with Disabilities**
<https://www.csus.edu/student-affairs/centers-programs/services-students-disabilities>
- **Reading and Writing Center**
<https://www.csus.edu/undergraduate-studies/writing-program>