California State University, Sacramento
College of Engineering and Computer Science

CSC 130: Data Structures and Algorithm Analysis

Fall 2019 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

Website

All the information in this syllabus – as well as other helpful information presented during the course – can be found online. Please note the lack of "www" and the tilde symbol before "cookd".

Website	**`http://athena.csus.edu/~cookd/130`**

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

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

Lectures

- Please ask questions and give comments. I enjoy back-and-forth interactions with students. There are no dumb questions!
- 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.
- Pop quizzes, if given, **cannot** be made up.
- 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

- 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!
- I don't mind students discussing, ahead of time, how to find a solution. In fact, it's a great idea! Just don't share solutions – just ideas!
- Late assignments are penalized. I will take off 10%, per day, starting immediately after the assignment is due. Weekend days are counted.
- You only get to submit each assignment once – so make sure you did it correct!
- Do **not** cheat or help others cheat. This means you cannot show your solution to another student or show how to do it. For example: don't copy off another student's screen or let them copy off yours.
- In **any** case of cheating, both the student, that copied the solution, and the one 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.

Exams

- The Final is comprehensive.
- If, for some reason, you will not be able to attend the exam, you must contact me *before* the exam date
- Any material covered in the lectures or assignments can be included in the exams.

Grading

Title	Percent
Assignments	25%
Midterm Exam	25%
Final Exam	50%
	100%

Note:

Depending on how much material is covered during the semester, the percentages may vary.

Resources

Students with Disabilities

If you have a disability and require accommodations, you need to provide documentation to SSWD (Services to Students with Disabilities). Please discuss any needs with me after class or in lab early in the semester.

Website: **www.csus.edu/sswd**

Writing Center

For free, one-on-one help with reading or writing in any class, visit the University Reading and Writing Center (URWC) in Calaveras Hall 128.

Website: **www.csus.edu/writingcenter**