SJSU SAN JOSÉ STATE UNIVERSITY

College of Science · Computer Science

Introduction to the Design and Analysis of Algorithms

CS 155

Spring 2026 Section 01 In Person 3 Unit(s) 01/22/2026 to 05/11/2026 Modified 01/22/2026

Contact Information

Instructor: David S Taylor

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Office Hours

Monday, 12:00 PM to 2:00 PM, MacQuarrie Hall 212

No office hours Monday, 3/2

By appointment
MacQuarrie Hall 212

Additional hours can be arranged if needed.

Course Information

Add/Drop date for this semester is February 17th. By that date, you need to make sure that you are enrolled if you are taking the course, or are dropped if you are not.

Lecture

Monday, Wednesday, 7:30 AM to 8:45 AM, Duncan Hall 450

This class is taught in-person.

Course Description and Requisites

Algorithm design techniques: dynamic programming, greedy algorithms, Euclidean and extended Euclidean algorithms, Discrete and Fast Fourier transforms. Analysis of algorithms, intractable problems and NP-completeness. Additional topics selected from: selection algorithms and adversary arguments, approximation algorithms, parallel algorithms, and randomized algorithms.

Prerequisite: CS 146 (with a grade of "C-" or better); Allowed Majors: Computer Science, Data Science, Applied and Computational Mathematics or Software Engineering; or instructor consent.

Letter Graded

Classroom Protocols

Class participation and feedback are very important to keep the course interesting. *If I am covering material too slowly or quickly, or if I am not clearly explaining things, you must let me know.* I prefer an interactive learning environment. If you disagree with something I say, speak up. Argue material with me in front of the class. It will make the class better, and right or wrong, constructive interaction will not not hurt your grade. If you are correct, clearly my mistake should be corrected. If you are incorrect, probably I have not explained something clearly anyway, and at least half of the class is confused by it. Point it out right then and there. In cases of exceptional participation that seem to benefit the class as a whole, I reserve the right to improve a student's grade by up to 1/3 grade.

Class Modality

This class is taught in-person.

Program Information

Diversity Statement - At SJSU, it is important to create a safe learning environment where we can explore, learn, and grow together. We strive to build a diverse, equitable, inclusive culture that values, encourages, and supports students from all backgrounds and experiences.

Course Learning Outcomes (CLOs)

Upon successful completion of this course, students should be able to:

- have a full understanding of various algorithmic design techniques: greedy, divide-and-conquer, and dynamic programming
- understand the general notion of complexity classes, P and NP, completeness and hardness, and the relationships between classes by reduction
- know when to use exact, heuristic, and approximation algorithms
- think recursively for algorithm design

Course Materials

This textbook is very widely used, and I hope it will come in handy beyond this course. It is currently in its 4th edition, but I will use the 3rd edition, which should be cheaply available. (The 4th edition should also be fine to use, and for our material, the 2nd edition is very similar to the 3rd edition. The 1st edition is different enough, and old enough, that I don't expect anyone to be using it.) I can try to post assignments for the 2nd, 3rd, and 4th editions of the book.

Introduction to Algorithms, 3rd Edition
Cormen, Leiserson, Rivest, and Stein
ISBN-10: 0262033844
ISBN-13: 978-0262033848
MIT Press, 2009

You can find errata (bug reports) for the book http://www.cs.dartmouth.edu/~thc/clrs-bugs/bugs-3e.php, for whichever printing of the book you get.

Course Requirements and Assignments

The following will be regularly assigned for time outside of class:

- Readings from textbook or handouts
- Written homework problems in Canvas

During the introduction of new material, homework is our chance to learn by making mistakes. It is expected that you will make an effort in all of the above for the sake of learning the material, and to give yourself feedback for your own learning.

You can do the homework in groups. It will not count towards your grade, but homework is where you can practice problem solving and get feedback, though I might not grade every homework. You may discuss problems with other groups, but it should be documented. You should not simply copy solutions, nor look for solutions (on the web or elsewhere)...what's the point, it doesn't count towards your grade anyway. Only one homework should be submitted per group.

If you do homework in a group...each group member should understand the entire submission. That can happen by one member explaining their part to other members, that is fine, but it should not be that you divvy up the work and only look at your own portion.

There will be at least one homework per topic listed below in the course schedule. That homework is to give you practice for the topic quiz.

There should be no incentive to "cheat" on homework, as it doesn't count towards your grade. If you get help from some source you aren't supposed to get help from, like just looking up the solution? Document it. Even if you aren't supposed to do it, if it is documented, I will not count it as an academic integrity issue, and it will help me to better understand what areas you are struggling with.

Grading Information

The course will have six quizzes during the semester, each taking up approximately 1/2 of a class period, on a different topic that we cover. Each of those quizzes will count 10% towards your course grade. The lowest quiz grade (excluding the dynamic programming quiz) will be dropped.

The final exam will count as 50% of your course grade...or 100% of your course grade, if that is better for you.

I will try to set grade breaks such that a few points on one quiz won't change your grade. That is, I will look for gaps in student scores when deciding where cut-offs are. However:

- The grade cut-off for an A- will be no higher than 60%.
- The grade cut-off for a B- will be no higher than 50%.
- The grade cut-off for a C will be no higher than 40%.
- The grade cut-off for a C- will be no higher than 35%.

University Policies

Per University Policy S16-9 (PDF) (http://www.sjsu.edu/senate/docs/S16-9.pdf), relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on the Syllabus Information (https://www.sjsu.edu/curriculum/courses/syllabus-info.php) web page. Make sure to visit this page to review and be aware of these university policies and resources.

Course Schedule

When	Topic	Notes
Weeks 1 and 2	Introductions and Greedy Proofs	
02/04/2026 12:00 PM - 1:15 PM	Quiz 1	Test dates are my current estimate, and subject to change.
Weeks 3 and 4	Geometric Algorithms	
02/23/2026 12:00 PM - 1:15 PM	Quiz 2	Test dates are my current estimate, and subject to change.
Weeks 5.5, 6, 7	Classic Algorithms	Euclid's Extended GCD, Strassen, FFT, Linear Selection?, Flow?
03/11/2026 12:00 PM - 1:15 PM	Quiz 3	Test dates are my current estimate, and subject to change.
Weeks 8, 9, 10	Dynamic Programming	

When	Topic	Notes
04/08/2026 12:00 PM - 1:15 PM	Quiz 4: Dynamic Programming	Test dates are my current estimate, and subject to change.
Weeks 11, 12	NP and Approximation	
04/22/2026 12:00 PM - 1:15 PM	Quiz 5	Test dates are my current estimate, and subject to change.
Weeks 13, 14	Advanced Topic	
05/06/2026 12:00 PM - 1:15 PM	Quiz 6	Test dates are my current estimate, and subject to change.
05/11/2026 12:00 PM - 1:15 PM	Last Day of Class	
05/13/2026 8:30 AM - 10:30 AM DH 450	Final Exam	