SJSU SAN JOSÉ STATE UNIVERSITY

College of Science · Computer Science

Data Structures and Algorithms

CS 146

Fall 2026 In Person 3 Unit(s) 08/19/2026 to 12/07/2026 Modified 08/15/2026

Contact Information

Instructor: Kostas Tsioutsiouliklis

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Class days/time: Mondays and Wednesdays, 9:00-10:15 AM

Classroom: Duncan Hall 450

Office hours: Mondays and Wednesdays, 10:15-10:45 AM in and around Duncan Hall 450, and by appointment.

Course Description and Requisites

Implementations of advanced tree structures, priority queues, heaps, directed and undirected graphs. Advanced searching and sorting techniques (radix sort, heapsort, mergesort, and quicksort). Design and analysis of data structures and algorithms. Divide-and-conquer, greedy, and dynamic programming algorithm design techniques.

Prerequisite(s): MATH 30, MATH 42, CS 46B, and [(CS 48 or CS 49J) if CS 46B was not in Java], each with a grade of "C-" or better; Computer Science, Applied and Computational Math, Forensic Science: Digital Evidence, Software Engineering, Data Science majors only; or instructor consent.

Letter Graded

Classroom Protocols

All class meetings, quizzes, and exams take place in person in Duncan Hall 450.

Students are requested to use Canvas messaging to contact the instructor or attend office hours.

Lectures are not recorded.

Lectures may not be recorded by students without prior permission of the instructor. Course materials developed by the instructor are the intellectual property of the instructor. Students may not (without prior permission of the instructor) publicly share or upload instructor-generated material for this course, including but not limited to exam questions, projects, lecture notes, lecture slides, hands-on exercises, or solutions.

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 will be able to:

- Implement lists, stacks, queues, search trees, heaps, union-find, and graphs and use these data structures in programs they design.
- Prove basic properties of trees and graphs.
- Perform breadth-first search and depth-first search on directed as well as undirected graphs.
- Use advanced sorting techniques (radix sort, heapsort, mergesort, quicksort).
- Determine the running time of an algorithm in terms of asymptotic notation.
- Solve recurrence relations representing the running time of an algorithm designed using a divide-and-conquer strategy.
- Understand the basic concept of NP-completeness.
- Understand algorithms designed using greedy, divide-and-conquer, and dynamic programming techniques.

Course Materials

Textbook: Cormen, Leiserson, Rivest, and Stein. Introduction to Algorithms, 3rd edition. MIT Press, 2009. ISBN 978-0262033848.

Technology: Laptop with internet access, Java (JDK 17 or newer) and an IDE of your choice.

Information: Syllabus, programming assignment instructions, etc. can be found on Canvas (https://sjsu.instructure.com (http://https//sjsu.instructure.com)). You are responsible for regularly checking the messaging system through MySJSU for updates, or other communication system as indicated by the instructor.

Course Requirements and Assignments

Per University Policy S16-9: "Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus." More details about student workload can be found in University Policy S12-3: http://www.sjsu.edu/senate/docs/S12-3.pdf (http://www.sjsu.edu/senate/docs/S12-3.pdf).

Assignment 0: Prerequisite Verification (ungraded, due Friday, August 21). Submitted on Canvas, required of everyone. Upload your unofficial transcript with the prerequisite courses highlighted: MATH 30, MATH 42, and CS 46B (plus CS 49J or CS 48 if your CS 46B was not in Java), each with a grade of C- or better. If you took any prerequisite outside SJSU, also upload your transfer credit report from MySJSU as a PDF, together with the highlighted transcripts showing your name, the institution, the term, and the grade. This assignment is not graded; its purpose is to confirm enrollment eligibility. If your prerequisites are not satisfied, you must drop the course, or I will need to drop you.

Projects may be discussed with peers, but must be completed individually unless otherwise specified. Code you submit must be written by you.

Academic Integrity Policy for AI-Assisted Software: Use of AI-assisted software must be cited as a reference source. Failure to cite the use of any AI-assisted software constitutes a violation of SJSU policy F15-7 and the School of Information's academic integrity policy (https://ischool.sjsu.edu/faculty-handbook-academic-integrity (https://ischool.sjsu.edu/faculty-handbook-academic-integrity)).

✓ Grading Information

Individual Programming Assignments (6)
Java implementations of the structures and algorithms we cover. Several require you to instrument your code and report measured results, not just produce working output. Each programming assignment is followed by a short in-class quiz on the assignment itself: the code you submitted, the decisions you made, the measurements you took.

Quizzes (9)
About 10 minutes at the start of class, on paper. Six are the assignment follow-up quizzes described above; three more cover recent lecture material in weeks without an exam. Questions are mostly multiple choice; a few may ask for short written answers. Your **lowest two scores are dropped**. There are no make-up quizzes. All quiz dates are announced in advance on the course schedule. There are no pop quizzes.

Exams
One in-class midterm and a cumulative final exam.

- **Midterm**: Wednesday, October 14
- **Final** (cumulative): TBD (assigned slot within Dec 9-16)

Grading Policy:

- 6 Individual Programming assignments: 25%
- 9 Quizzes: 15%
- Midterm exam: 25%
- Final exam: 35%

Grade Scale

- A+ 97-100, A 93-96, A- 90-92
- B+ 87-89, B 83-86, B- 80-82
- C+ 77-79, C 73-76, C- 70-72
- D+ 67-69, D 63-66, D- 60-62
- F below 60

All students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades. See University Policy S20-2 (https://www.sjsu.edu/senate/docs/S20-2.pdf (http://www.sjsu.edu/senate/docs/S20-2.pdf)) for more details.

Late Work
You have a budget of **three late days** for the semester, usable on programming assignments in whole-day increments, no explanation required. Spend them as you see fit. Note that the follow-up quiz for an assignment happens on schedule regardless of late days. Beyond that budget, late work receives no credit absent a documented emergency. Talk to me as early as you can when something goes wrong.
No assignment will be accepted after the last day of instruction, December 7, 2026, per university policy.

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

Week-by-week schedule posted on Canvas, subject to change with fair notice.

Key semester dates:

- Instruction begins **August 19**
- Last day to add or drop **September 15**
- No class **September 7** (Labor Day), **November 11** (Veterans Day), **November 25** (non-instructional day), **November 26-27** (Thanksgiving)

- Last day of instruction **December 7**
- Final exams **December 9-11** and **December 14-16**