Recent Announcements

Annotated slides for Lec05 and Lec06 posted

(https://ucsb.instructure.com/courses/31236/discussion_topics/398756)

Hi all, I've uploaded the annotated slides for the past two lectures. Apologies for posting this late. I'll ensure future annotated slides are posted right after the lecture. - Nabeel

Posted on:

Jan 24, 2026, 8:14 AM

PA1 released on Kattis and due on Friday, Feb 13th 11:59PM

(https://ucsb.instructure.com/courses/31236/discussion_topics/398535)

Hi all, The programming assignment (PA1) has been released on the W26 course page on Kattis. The deadline for PA1 is Friday, Feb 13th 11:59PM. I would strongly recommend starting early, particularly because to get full credit your submissions need to pass ALL the test cases for both the problems. Please find the instructions to register yourself on the course and other important notes and policies here: Kattis Instructions.pdf (Week2 modules). If you have questions, please post on Piazza. - Nabeel

Posted on:

Jan 23, 2026, 9:31 AM

PA0 due on Kattis this Friday 11:59PM

(https://ucsb.instructure.com/courses/31236/discussion_topics/398243)

Hi all, PA0 is due tomorrow, Friday 01/23 11:59PM. I'm just sending out a reminder. Although it's ungraded, I would highly recommend submitting those problems for PA0. It will help you get familiarized with Kattis. Things like how to read inputs, etc. would come in handy when you're solving the problems for PA1. - Nabeel

Poste

Jan 22, 2026, 7:56 AM

CMPSC 130A - DATA STRUCT ALGORTH - Winter 2026

Course Information

Lectures: Tue/Thu, 2:00 PM - 3:15 PM (📍 **HFH 1104** (https://map.ucsb.edu/?id=1982#!m/618898))

Discussion Sections: Fridays 10AM (📍 **PHELPS 1508** (https://map.ucsb.edu/?id=1982#!m/618904)), 11AM (📍 **PHELPS 1508** (https://map.ucsb.edu/?id=1982#!m/618904)), 12PM (📍 **ELLSN 2626** (https://map.ucsb.edu/?id=1982#!m/618908))

Homework Assignment Submissions: https://www.gradescope.com/ (https://www.gradescope.com/)

Q&A/Discussion: https://piazza.com/ucsb/winter2026/cs130a (https://piazza.com/ucsb/winter2026/cs130a)

Anonymous Feedback: https://forms.gle/KXLEERCBU9vgHtkJA (https://forms.gle/KXLEERCBU9vgHtkJA)

Teaching Team Information

Instructor: Nabeel Nasir (nabeeln@ucsb.edu)

Office Hours: Mondays 3PM - 5PM, HFH 1115

Teaching Assistants (TAs):

Name	Email	Office Hours
Grecia Castelazo	gcastelazo@ucsb.edu	Friday 9AM-11AM, Trailer 936 Room 103
Alvin Liu	ziyueliu@ucsb.edu	Wednesday 10AM - 12PM, HFH 4110
Saurabh Sharma	saurabhsharma@ucsb.edu	Monday, 8AM-10AM, HFH 2120A

Undergraduate Learning Assistants (ULAs):

Name	Email	Office Hours
Om h	ommahesh@ucsb.edu	Thursday 3:30PM-5:30PM, CSIL Annex (Building 434, Room 122A)
Zoey Nielsen	zanielsen@ucsb.edu	Wednesday 2PM - 4PM, Trailer 936 Room 103

Megumi Ondo	megumiondo@ucsb.edu	Thursday 11AM-1PM, Trailer 936 Room 103

Discussion Section	Location	TA	ULA
Fridays 10:00 AM			
Fridays 11:00 AM			
Fridays 12:00 PM			

Course Overview and Prerequisites

In this course, you'll build on the strong foundation you've developed in **CMPSC 16 and CMPSC 24**, where you learned about data structures and algorithms, and **CMPSC 40**, where you honed your proof-writing skills. With these tools already in your arsenal, you'll expand your understanding by exploring **new data structures and algorithms**, applying them to real-world problems, and strengthening your ability to **analyze and prove their correctness**. This course is designed to enhance your **problem-solving and reasoning skills**, preparing you for more advanced topics in computing and algorithm design.

Learning Objectives

By the end of this course, you will be able to:

1. Build on your knowledge of data structures by implementing and analyzing data structures like hash tables, heaps, and balanced search trees, understanding their efficiency and real-world applications.
2. Apply algorithmic analysis techniques with confidence, using Big-O, Theta, and Omega notation to evaluate performance and make informed decisions about data structure selection.
3. Leverage graph algorithms to solve complex problems, mastering BFS, DFS, topological sorting, Dijkstra's algorithm, and MST algorithms.
4. Build on your ability to analyze algorithms by using techniques like induction, amortized analysis, and p[illegible]listic reasoning to deepen your understanding of how and why algorithms work correctly and e[illegible]dy.
5. Recognize and apply data structures in computing, understanding their critical role in designing efficient algorithms and solving real-world software challenges.

Textbook

Data Structures and Algorithm Analysis in C++ by Mark Allen Weiss, 4th Edition.

Grading Scheme

Your course grade will be calculated as follows:

Item	Grade%	Notes
Discussion Section Attendance	2%	• LeetCode-style algorithm brainstorming (1–2 problems per section) • Attendance credit based on presence only • Must be present for most of the section • **Up to two absences excused automatically**
Homework Assignments	20%	• 8 assignments (roughly 1 every week) • All assignments equally weighted • **Lowest homework will be dropped**
Programming Assignments	18%	• 2 programming assignments equally weighted • On the UCSB Kattis website
Midterm Exam	25%	• In-person, required, no makeup
Final Exam	35%	• Cumulative, in-person, required, no makeup

Attendance and Participation

Students are expected to keep up their attendance of lectures, although I will not actively take attendance during lectures. I will often ask for participation, usually in the form of answering poll questions in class using iClicker, a free tool that can be used from a smartphone or laptop computer. **This link (https://help.lsit.ucsb.edu/hc/en-us/articles/360054938191-iClicker-Cloud-for-Students)** will tell you more about how to download and use iClicker as a UCSB student.

Assignments

This course has Homework and Programming Assignments. Usually, every week, you will have 1 hom

Homework

The homework assignments are typically due every Tuesday (unless told otherwise) and have to be submitted on Gradescope. You can only turn in your assignments on Gradescope, so we will not accept nor grade assignments emailed to us. **At the end of the quarter, I will drop the lowest homework grade.**

Your homework assignment will be given to you as a PDF document. You should submit your homework as a PDF file on Gradescope. **No format other than PDF will be accepted and graded**.

Programming Assignments

The programming assignments will be administered and handed in using the online programming platform Kattis (**https://ucsb.kattis.com (https://ucsb.kattis.com)**).

Exams

This course has a midterm exam and a final exam. Both will be in-person and in our classroom. **Taking both these exams is required to pass the course. There are NO make ups for missed exams.**

Course Schedule

Week	Lecture	Homework	PA
Week1	L01: Course logistics + Review of algorithm analysis	H01: Released	
	L02: Review of Algorithm analysis		
Week2	L03: Review of Algorithm analysis, BST review	H01: Due H02: Released	
	L04: AVL Trees		PA0: Released
Week3	L05: AVL Trees Analysis, Heaps: Priority Queue ADT, basic operations, heapsort	H02: Due H03: Released	
	L06: Heaps: buildHeap, Leftist Heaps		PA0: Due

			PA1: Released
Week4	L07: Leftist Heaps, Graphs	H03: Due H04: Released	
	L08: Graphs: topological sort, DFS, single-source shortest path on unweighted graphs (BFS)		
Week5	L09: Graphs: single-source shortest path on weighted graphs (Dijkstra's)	H04: Due H05: Released	
	L10: Graphs: strongly connected components		
Week6	L11: Graphs: biconnectivity	H05: Due	
	Midterm Exam **(Thursday, February 12th)**		PA1: Due PA2: Released
Week7	L12: Minimum Spanning Tree: problem definition, prim's	H06: Released	
	L13: Minimum Spanning Tree: kruskal's **(No lecture, Recorded Video)**		
Week8	L14: Union-find	H06: Due H07: Released	

	L15: Union-find		
Week9	L16: Hashing	H07: Due H08: Released	PA2: Due
	L17: Hashing		
Week10	L18: Hashing + Amortized Analysis (if time)	H08: Due	
	Exam Review		
	Final Exam **(Tuesday, March 17th 4PM)**		

Notes:

- The lecture topics, PAs, homework, and/or their dates are subject to change or re-arrangement.
- Homework and PAs are always **due on Tuesdays by 11:59 PM** unless told otherwise.

Class Grade Distributions

These are calculated to 2 decimal places and **very strictly assigned**.

Range	**Grade**	**Range**	**Grade**
[93 - 100]	A	[77 - 80)	C+
[90 – 93)	A-	[73 - 77)	C
[87 – 90)	B+	[70 - 73)	C-
[83 – 87)	B	[60 - 70)	D
[80 -	B-	< 60	F

A+ grades: These may be awarded to the very best performing students in the class—but the cutoff for A+ grades will be determined at the end of the course at the discretion of the instructor (there is no predetermined cutoff---an average of 97 or more doesn't guarantee you an A+ grade.)

F grades: **If you miss your final exam, you will receive an F, regardless of your running score in the class**. If you feel that I or the TAs have made a mistake (like adding up a grade incorrectly), then you should certainly bring that to my attention in an expedient fashion.

Please do NOT ask me to round up your final class grade at the end of the quarter. Please know that I will not engage with you in these requests. If you have any questions about how grades are computed, please feel free to ask, and I would be happy to explain further.

“Slip” days for Homework Assignments

You have a **total of 3 “slip” days to use throughout the quarter for homework assignments**. You may use **up to 2 slip days on any one homework**. We will automatically apply the slip days if you submit the homework late. **After using 2 slip days** (or if you run out of slip days) there will be a **20% penalty** for one day late. After that the homework will not be accepted.

Late submissions will not be accepted for Programming Assignments.

Make up Policy

No makeup is allowed for assignments except in rare cases, if there is a documented family emergency, documented extended illness, documented required court appearance, or other situation beyond the students' control (with documentation), then the professor may grant additional make up days entirely at the instructor's discretion – but this is not a guarantee or a right.

Again: No makeup is allowed for missed exams whatsoever.

Regrade Requests

If you believe that a grade on a homework assignment is wrong, you may ask for a review for a possible re-grade. For assignments, you have to **place a request via Gradescope within 3 days** from when the grade was issued.

Assistance to Students

This has teaching assistants (TAs) and undergraduate learning assistants (ULAs). The TAs will lead and hold office hours. The ULAs will also be holding office hours and helping you during labs.

You can also pose questions and answer each other's questions on Piazza. Please do not use Piazza to post outright solutions to homework or lab problems – you can, of course, discuss the exercises and ways to solve the problems.

If you have questions that you'd rather email us with (for example, those of a personal nature), then **PLEASE put "CS130A" in the subject line**.

Note to Students with Disabilities

Please register your accommodation requests with DSP at your very earliest opportunity – this is best done by the first or second week of the quarter. Make sure that you submit your DSP request no later than one week before a scheduled exam. The instructor will accommodate students only according to information gotten from the DSP office.

UCSB and Instructor's Policies on Academic Integrity and Honesty

Academic Integrity

It is expected that students attending the University of California understand and subscribe to the ideal of academic integrity, and are willing to bear individual responsibility for their work. Any work (written or otherwise) submitted to fulfill an academic requirement must represent a student's original work. **Any act of academic dishonesty, such as cheating or plagiarism, will subject a person to University disciplinary action**. Using or attempting to use materials, information, study aids, or commercial "research" services not authorized by the instructor of the course constitutes cheating. Representing the words, ideas, or concepts of another person (or copied from an LLM like "ChatGPT") without appropriate attribution is plagiarism. Whenever another person's written work is utilized, whether it be a single phrase or longer, quotation marks must be used and sources cited. Paraphrasing another's work, i.e., borrowing the ideas or concepts and putting them into one's "own" words, must also be acknowledged.

I will report the violation to the Associate Dean of Students for possible referral to the Conduct Committee. That committee has the authority to impose a range of sanctions, including suspension. Further information is available at: **https://studentconduct.sa.ucsb.edu/academic-integrity (https://studentconduct.sa.ucsb.edu/academic-integrity)**

Cheating on exams

If you come across a previous quarter's midterm or final, you are under the obligation of the university's "code of conduct" to surrender it (and all copies of it) to me. If, however, you choose to study from a previous quarter's midterm or final, no matter how that exam came into your possession, be aware that *you are cheating*, and if found out will receive a zero.

During exams, you may not look at another student's test or answers, share your answers/test with another student, nor remove a test from the exam room. **All of these behaviors are forms of cheating and will result in a zero on the exam, at minimum**.

Non-discrimination Policies

Under Title IX, university students are protected from harassment and discrimination based on gender and sex. If a student feels uncomfortable or in need of support at any time related to their gender, sex, and/or sexual orientation, please contact your TA and/or course instructor immediately. If a student would like to disclose information related to pronouns, name changes, or identities, we encourage you to do so. UCSB's Resource Center for Sexual and Gender Diversity on the 3rd floor of the Student Resource Building is also available to advocate and be of and support to students.

You can specify your preferred pronouns on GOLD, these are shown in GauchoSpace. Similarly, you can check others' pronouns when responding to refer to them properly in this class. Remember that it is always okay to use someone's name to avoid using the wrong pronouns for them. For more information, visit **http://rcsgd.sa.ucsb.edu/education/pronouns (http://rcsgd.sa.ucsb.edu/education/pronouns)** .

All students have the right to learn and participate in a classroom environment free of intimidation, harassment, and discrimination based on characteristics such as gender, race, age, sexual orientation, disability, religious or political beliefs and affiliations. I will address any related issues that surface immediately; please help me to cultivate a positive classroom environment by communicating any concerns that you have.

Statement on Sexual Harassment

UCSB does not tolerate sexual harassment/sexual violence, which is prohibited by University policy and state and federal law. The Title IX Compliance and Sexual Harassment Policy Compliance Office (TIX/SHPC) provides assistance in preventing and resolving and investigating complaints of sexual harassment/sexual violence and gender discrimination. **https://oeosh.ucsb.edu/titleix (https://oeosh.ucsb.edu/titleix)**

Mandatory Reporting

As an instructor, one of my responsibilities is to help create a safe learning environment on our campus. I want to ensure that students feel they can speak to me, but I also want students to be informed that I have a mandatory reporting responsibility related to my role as an instructor. I am required to share information regarding sexual misconduct or information about a crime that may have occurred on UCSB campus or in the community. A result of my mandated report will be that students will receive outreach and resources from the campus Title IX office. Students may speak to someone confidentially by contacting CARE, Campus Advocacy, Resources & Education at the 24/7 advocacy line at (805) 893-4613 or visit them in person at the Student Resource Building.

Mental Health

Personal concerns such as stress, anxiety, relationships, depression, cultural differences, can interfere with the ability of students to succeed and thrive. For helpful resources, please contact UCSB Counseling & Psychological Services (CAPS) at 805-893-4411 or visit http://counseling.sa.ucsb.edu (http://counseling.sa.ucsb.edu) .

Additional Campus Resources

If you experience difficulty in this course for any reason, please don't hesitate to contact your instructor. The following campus services might also be beneficial to you. Please use them as needed.

Disabled Students Program

Location: 2120 Student Resources Building | 805.893.2668 | http://dsp.sa.ucsb.edu/ (http://dsp.sa.ucsb.edu/)

The Disabled Students Program offers many services, such as reading services, notetaking assistance, test-taking accommodations, and registration assistance. For more information on these services, eligibility, and registration, please call or visit the Disabled Students Program office.

CSO Safety Escorts

805.893.2000 | https://www.police.ucsb.edu/cso/cso-safety-escorts (https://www.police.ucsb.edu/cso/cso-safety-escorts)

The CSO (Community Service Organization) Escort Program is a free service provided to all students, faculty and community members during the evening and early morning hours. The objective of the escort service is to provide a safer mode of transportation through campus and Isla Vista. The escort service is based on the "buddy" system which is to simply provide another person to travel with you to your destination. The CSO Escort Service can be used by simply calling the Police Dispatch through the Escort Phone Line at 893-2000. Escorts can also be requested through the Red Emergency Phones located all over campus.

Food For All

If you are facing any challenges securing food or housing, and believe this may affect your performance in the class, you are urged to meet with a Food Security and Calfresh Advocate, who is aware of the broad variety of resources that UCSB has to offer (see their drop-in hours at food.ucsb.edu). You are also [illegible] to contact the professor or teaching assistant if you are comfortable doing so. Please visit food.ucsb.edu (http://food.ucsb.edu) for additional resources including Calfresh (http://food.ucsb.edu/calfresh) , the AS Food Bank (https://foodbank.as.ucsb.edu/) , and more (http://food.ucsb.edu/about/learn/resource-guides) .

Campus Learning Assistance Service

Location: Student Resource Building 3210 | 805.893.3269 | http://clas.sa.ucsb.edu/ (http://clas.sa.ucsb.edu/)

CLAS helps students increase their mastery of course material through course-specific tutoring and academic skills development. The tutorial groups and drop-in tutoring schedules are posted on the website. CLAS also provides workshops and counseling in test-taking as well as paper-writing skills.

Counseling Services (CAPS)

Location: Building 599 | 805.893.4411 | http://caps.sa.ucsb.edu/ (http://caps.sa.ucsb.edu/)

Counseling Services offers counseling for personal concerns and crisis intervention, stress management, self-help information, and connections to off-campus mental health resources.

There is a Mental Health Peer Services in CAPS that offers drop-in peer counseling, massage & egg chairs, workshops on managing stress (and many other topics), as well as one-on-one sessions with a peer to help students learn coping skills to reduce anxiety (School Anxiety Program).

CARE (Campus Advocacy, Resources & Education)

Location: Student Resource Building, 1st Floor | http://wgse.sa.ucsb.edu/Care (http://wgse.sa.ucsb.edu/Care)

Provides confidential advocacy and support to anyone impacted by sexual assault, dating/domestic violence and stalking.

Office of Student Life

Location: Student Resource Building 1104 & 2260 | 805.893.4569 | http://osl.sa.ucsb.edu/ (http://osl.sa.ucsb.edu/)

The Office of Student Life provides assistance with student emergencies, administrative withdrawals, and other unique academic situations and options.

ONDAS Student Center

Location: Kerr Hall 1150 | 805.893.3457| http://ondas.ucsb.edu/ (http://ondas.ucsb.edu/)

The OSC offers academic support, mentoring, special programming, and community for all UCSB students, especially first generation students.

Tra[illegible]er Student Center

Location: UCSB Library, First Floor, Ocean Side | http://www.transfercenter.ucsb.edu/ (http://www.transfercenter.ucsb.edu/)

A space for transfer students to make connections, find academic support, mentoring, and special programs.

Undocumented Student Services

Location: 2210 Student Resource Building | 805.893.5609 http://www.sa.ucsb.edu/DreamScholars (http://www.sa.ucsb.edu/DreamScholars)

USS provides general counseling to undocumented and mixed status students. Services include access to student mentors, programs and legal service referrals.

Educational Opportunity Program

Location: Student Resource Building, Room 2210 | 805.893.4758 | http://eop.sa.ucsb.edu/ (http://eop.sa.ucsb.edu/)

EOP provides advising, mentoring, and programming for first generation and income eligible students.

Office of International Students & Scholars

Location: Student Resource Building, Room 3130 | 805.893.2929 | http://oiss.sa.ucsb.edu/oiss-home (http://oiss.sa.ucsb.edu/oiss-home) OISS provides immigration support for the UCSB community, advising for international students, and cultural programming.

Academic Initiatives

Number: 805.893.2720 | http://academics.sa.ucsb.edu/ (http://academics.sa.ucsb.edu/)

Student Affairs Academic Initiatives facilitates student academic and leadership opportunities, and community engagement.