

Spring 2025 CS 33: Intro to Computer Organization Syllabus

Course Logistics

Instructor	Sandra Batista
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Lecture: TTh 4-5:50 pm PT, Moore 100

Discussions:

Discussion 1A, F 10-12pm PT, Rolfe Hall 1200

Discussion 1B, F 10-12pm PT, Kaplan Hall 169

Discussion 1C, F 12-2pm PT, Perloff Hall 1102

Discussion 1D, F 12-2pm PT, Dodd Hall 170

Discussion 1E, F 2-4pm PT, Dodd Hall 170

Final Exam: Wednesday, June 11, 2025 11:30 am - 2:30 pm PT

Course Units: Lecture, 4 hours; discussion, 2 hours; outside study, 9 hours

Textbooks (Required): Randal E. Bryant and David R. O'Hallaron. 2015. Computer Systems: A Programmer's Perspective (3rd. ed.). Pearson. (*Please do not use 2nd edition. There should be reasonably priced edition accessible through bookstore.*)

Prerequisites or Requisites: CS 31, CS 32

Course Communication: All course communication and materials will be shared via BruinLearn (primarily) and university email. All assignments will be posted and graded via Gradescope that is linked on BruinLearn. Piazza will be used for discussion and it is automatically synchronized with BruinLearn. Times and locations for office hours are also given on BruinLearn.

Course Description

How does software interact with hardware in the computer systems that we use every day? How do operating systems facilitate this interaction between software and hardware? How do computers represent data in number systems and how is data represented to hardware using the instruction set architecture? Using the x86 computer architecture, students will learn how programs are represented to hardware using assembly language. We will also examine how concurrency, virtualization, and process management are supported in computer systems. Using this knowledge students will learn how to improve system performance and security.

Learning Objectives

By the end of the quarter, students will be able to

- Demonstrate how numbers are represented in a computer

- Execute the basic operations that computers perform
- Evaluate how CPUs exploit parallelism to improve system performance
- Describe the basic roles of the operating system
- Improve program performance with basic optimizations
- Exhibit better Linux, C programming, and GDB skills

Grading

Artifact	Weight	Date
Midterm	20%	May 6
Final Exam	25%	June 11
Labs	35% (Warmup 3%, Remaining 4 at 8% each)	Various
Discussion Work	20%	Various
	Learning Pod Check-ins 10%	Various
	Individual Exercises 10%	Various

Labs

There will be 5 coding labs. These are comprehensive coding assignments that permit you to practice what we are learning. These assignments require a good time commitment, so please start them early. The work that you submit for labs must be your *individual effort*.

Discussion Work

Attendance and participation at discussion is required. There will be collaborative group work during every discussion section that will be supported by our teaching assistants and learning assistants.

1. You will create learning pods of ideally 4 people. It is necessary to form pods within the same discussion section. Your main collaboration team during discussions will be your learning pod.
2. *Learning Pod Contract*: Each learning pod must create a contract for conduct and expectations that will be submitted as part of the first check-in. *The learning pod contract must include which members will be responsible for check-in for each week of the quarter.* The responsible pod members must stay for the entire discussion section. (You may change the schedule as needed during the quarter if extenuating circumstances arise, but this expectation should be in the contract. More expectations on this are underlined below.)
3. *Discussion check-ins, 10x1%*: There will be a learning pod check-in due during discussion sections. These check-in correspond to demonstrating progress towards discussion problems. You do not have to have all the problems completed to do so, but you do need to demonstrate group progress for the check-in by the end of discussion section. A satisfactory check-in is collaborating with a TA or LA on a problem or showing a completed problem to an LA or TA. At least 2 pod members must be available to demonstrate group progress for the check-in. Every pod member must attend at least 5 check-ins. The learning pod must also submit a sample of work as part of the check-in on Gradescope. .
4. *Discussion Worksheets, 10x1%*: Each student must submit their entire individual solutions to all discussion worksheet problems. These solutions should reflect your individual expression of your understanding of the solutions. You must list your pod members, teaching assistants,

and learning assistants as collaborators. These will be graded for completeness and good faith effort.

Exams:

All exams will be open course materials only and independent effort. All exams will be cumulative. You may ask for clarifications from the course staff, but you may not communicate with others outside the course staff on exams for any reason. The midterm will be on May 6, 2025 during class. The final will be on June 11 as designated by the registrar.

Lecture attendance and class participation:

For lectures there are no formal attendance or participation requirements except that you must be present for the midterm exam held during class. I welcome you to ask questions and participate at all times during lectures and office hours and on piazza. I welcome your constructive feedback and input also. We want to create a supportive, collaborative learning environment in which you achieve maximum benefits from this course and your active participation will help towards that goal.

Academic honesty:

Please abide by the UCLA student conduct [policies](#).

Please note the following clarifications:

1. Authorized course materials are only released by the course staff this quarter. Using exams and assignments from previous quarters is considered using unauthorized materials. Using Chegg or other solution repositories is also considered using unauthorized materials.
2. Sharing your code from lab solutions or other individual assessments is not permitted during this quarter or in the future.
3. Since discussing course content, exercises, and lab assignments at high-level (i.e. not at code level) is permitted, it is necessary for you to list your collaborators on your assignments. You must also give citations for any additional resources such as textbooks or websites that you use.
4. The use of GenAI is not permitted on your assignments.

Grading reconsideration:

We honor transparency and fairness in grading. Please monitor your scores for accuracy. You may submit a regrade request for your work within one week of our release of scores. Please submit your requests for regrades via Gradescope including any inaccuracies, what parts you want regraded and why. Once the reconsideration period has passed, grades are considered final.

Late work policy:

Deadlines for all assignments will be given on BruinLearn with time deadline. Tentative deadlines are already on the tentative course schedule. No late work will be accepted. For extenuating circumstances, appropriate accommodations can be arranged by emailing the instructor.

Tentative Schedule

Week	Day	Topic	Readings	Due
1	4/1 4/3 4/4	Intro+Bits and Bytes Integers	Ch. 1, 2.1, 2.2 Ch. 2.1-2.3	DW 1 & Pod contract
2	4/8 4/10 4/11	Assembly I: Basics Assembly I: Basics	Ch 3.1-3.5	DW 2 & Warmup Lab
3	4/15 4/17 4/18	Assembly II: Control Assembly III: Procedures	Ch 3.6 Ch 3.7	DW 3 & Data Lab
4	4/22 4/24 4/25	Assembly IV: Data Assembly V: Advanced	Ch 3.8-3.9 Ch. 3.10	DW 4
5	4/29 4/30 5/1 5/2	Floating Point Midterm Review	Ch. 2.4	Bomb Lab DW5
6	5/6 5/8 5/9	Midterm Exam Program Optimization	Ch. 5	DW 6
7	5/13 5/15 5/16	Memory Hierarchy Caches	Ch 6.1-6.4 Ch. 6.5-6.7	DW 7
8	5/20 5/22 5/23	Multi-threading Thread Synchronization	Ch 12.1-12.3 Ch 12.4-12.7	DW 8 & Attack Lab
9	5/27 5/29 5/30	Virtual Memory Exceptions, Processes Linking	Ch. 9.1-9.8 Ch. 8.1-8.3 Ch. 7.1-7.9	DW 9
10	6/3 6/5 6/6	MIPS Final Exam Review		DW 10 & Parallel Lab
	6/11	Final exam 11:30 am - 2:30 pm		

Note:

1. All readings are from the required textbook.
2. **DW** stands for Discussion Work. This includes the individual submission of the discussion worksheet problem solutions and the learning pod check-in during discussion with the group submission for the week.
3. All assignments are due by 11:59 pm on their due date.

University Policies and Support for Students

Academic Integrity

UCLA is a community of scholars. In this community, all members including faculty, staff and students alike are responsible for maintaining standards of academic honesty. As a student and member of the University community, you are here to get an education and are, therefore, expected to demonstrate integrity in your academic endeavors. You are evaluated on your own merits. Cheating, plagiarism, collaborative work, multiple submissions without the permission of the professor, or other kinds of academic dishonesty are considered unacceptable behavior and will result in formal disciplinary proceedings usually resulting in suspension or dismissal. See the [Dean of Students website](#) for more information.

[source: Dean of Students syllabus statement ([syllabus](#))]

Accommodations for Students with Disabilities

If you are already registered with the Center for Accessible Education (CAE), please request your Letter of Accommodation in the Student Portal. If you are seeking registration with the CAE, please submit your request for accommodations via the CAE website. Students with disabilities requiring academic accommodations should submit their request for accommodations as soon as possible, as it may take up to two weeks to review the request. For more information, please visit the CAE website, visit the CAE at A255 Murphy Hall, or contact us by phone at (310) 825-1501.

[source: Center for Accessible Education ([Faculty Questions](#))]

Resources for Students

UCLA provides resources if you are feeling overwhelmed and need personal and/or academic assistance. Please see the [Red Folder](#) for more information.

Title IX and Equity, Diversity and Inclusion

Advocacy and Confidential Services:

Please note that Title IX prohibits gender discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking. If you have experienced sexual harassment or sexual violence, you can receive confidential support and advocacy at the CARE Advocacy Office for Sexual and Gender-Based Violence, 205 Covell Commons, Los Angeles, CA, 90095, care@careprogram.ucla.edu, (310) 206-2465. Counseling and Psychological Services (CAPS) provides confidential counseling to all students and can be reached 24/7 at (310) 825-0768.

Reporting and Non-confidential Services:

Your professor is required under the UC Policy on Sexual Violence and Sexual Harassment to inform the Title IX Coordinator should he become aware that you or any other student has experienced sexual violence or sexual harassment. In addition, You can also report sexual violence or sexual harassment directly to the University's Title IX Coordinator, 2255 Murphy Hall, titleix@equity.ucla.edu , (310) 206-3417. Reports to law enforcement can be made to UCPD at (310) 825-1491.

Engineering EDI Resources:

There are a number of specific resources on Equity, Diversity, and Inclusion available to students in the Samueli School of Engineering, including trained faculty officers in each department who can be consulted if you have a question on EDI issues and are not sure where else to turn. Please see <https://samueli.ucla.edu/equity-diversity-and-inclusion> for information.