SJSU SAN JOSÉ STATE UNIVERSITY

College of Science · Computer Science

Introduction to Computer Systems

CS 47

Fall 2026 Section 01 In Person 3 Unit(s) 08/19/2026 to 12/07/2026 Modified 08/15/2026

Contact Information

Contact Information

Instructor: Seshadri Paravastu
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Office Hours: Tuesdays, 5:00 PM–7:00 PM Pacific Time, via Zoom, by appointment
Booking: Book a 10-minute appointment: scheduler.zoom.us/seshadri-paravastu/10min

Course Information

Course: CS 47-01 — Intro to Computer Systems (Seminar)
Class Number: 44678
Term: Fall 2026
Units: 3
Mode: In Person
Lecture: Tuesday and Thursday, 1:30 PM–2:45 PM
Location: Duncan Hall 450
Class Dates: August 19–December 7, 2026
First Class Meeting: Thursday, August 20

Scheduled Remote Meetings: October 13, 15, and 20. These are planned remote/asynchronous exceptions; all other regular meetings, including October 8, remain in person.

Final Exam: Tuesday, December 15, 2026, 1:00 PM–3:00 PM; regular classroom unless otherwise assigned.

Course Description:
Instruction sets, assembly language and assemblers, linkers and loaders, data representation and manipulation, interrupts, pointers, function calls, argument passing, and basic gate-level digital logic design.

Prerequisite(s): CS 42 / MATH 42, and CS 46B (with a grade of "C-" or better).

Allowed Majors: Computer Science, Data Science, and Forensic Science: Digital Evidence.

Grading: Letter Graded.

Course Description and Requisites

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Grading: Letter Graded.

Classroom Protocols

This course follows San Jose State University classroom conduct and academic integrity policies. To maintain a professional and productive learning environment, the following expectations apply:

Eating and Drinking

- Only water is permitted in the classroom unless otherwise approved.
- Food consumption that disrupts class activities is not permitted.
- Students who do not comply when asked may be asked to leave for the remainder of the class period and may lose participation credit.

Cell Phones and Electronic Disruptions

- Cell phones must be silenced or placed on vibrate mode during class.
- Phone calls, messaging, and non-academic use during class are not permitted.
- Repeated disruptions may result in removal from class and referral under SJSU Student Conduct policies.

Computer and Device Use

- Laptops and tablets are permitted only for class-related activities, including note-taking, viewing instructor-provided materials, and in-class coding or exercises.
- Use of devices for unrelated activities, including social media, browsing, and messaging, is considered disruptive.
- Students engaging in non-class-related device use may be asked to leave and may lose participation credit.
- Continued disruption may be referred under university conduct procedures.

Recording and Distribution of Course Materials

- Recording of lectures or classroom activities is not permitted without explicit instructor approval or approved accommodations.
- Course materials, including slides and recordings, may not be distributed publicly without permission.

Classroom Conduct

- Professional and respectful behavior is expected at all times.
- Disruptive behavior may result in removal from class and referral to appropriate university offices under SJSU policy.

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 Goals

Instruction sets, assembly language and assemblers, linkers and loaders, data representation and manipulation, interrupts, pointers, function calls, argument passing, and basic gate-level digital logic design.

Course Learning Outcomes (CLOs)

- Be familiar with the architectural components of a computer system: CPU (registers, ALU), memory, buses.
- Be able to convert between decimal, binary, and hexadecimal notations.
- Work with two's complement integers, floating-point numbers, and character encodings.
- Be able to write assembly programs that use load/store, arithmetic, logic, branches, call/return, and push/pop instructions.
- Understand the gate-level operations of a basic ALU.

Course Materials

Required Texts/Readings

COMPUTER ORGANIZATION and DESIGN, 5th Edition
Author: David A. Patterson
ISBN: 9780124077263
Publication Date: 10/10/2013
Publisher: Elsevier

Other Readings

Logic & Computer Design Fundamentals, 5th Edition
ISBN: 9780133760637
Authors: M. Morris R. Mano; Charles R. Kime; Tom Martin
Publisher: Pearson

Course Requirements and Assignments

Quizzes

Quizzes assess students' understanding of foundational computer systems concepts and their ability to apply those concepts correctly and precisely. Questions emphasize conceptual reasoning, short calculations, and interpretation of low-level behavior rather than memorization alone.

Topics may include number systems and data representation, two's-complement arithmetic, assembly language concepts, MIPS instructions and registers, memory organization and alignment, endianness, assembler behavior, Boolean algebra, and basic digital logic.

Questions may include multiple-choice, short-answer, matching, and brief problem-solving items. Students are expected to understand why an answer is correct, not merely recall facts.

Fall 2026 assessment note: Quiz 2 is scheduled as a timed remote Canvas assessment on Thursday, October 15. Details and the access window will be announced in advance.

Midterm Exams

The midterm exams evaluate students' ability to integrate concepts across multiple topics and apply them to more involved system-level problems. Compared with quizzes, the midterms place greater emphasis on multi-step reasoning, interpretation of assembly code, and interactions between software and hardware components.

Questions may require analysis of MIPS assembly programs, register use and calling conventions, memory layouts and data alignment, assembler directives and pseudo-instructions, and numeric or logical transformations. Students must demonstrate clear reasoning and accurate calculations.

Midterm I: Thursday, October 22, in class.
Midterm II: Tuesday, November 17, in class.

Final Project — Experiential Learning Project

The Final Project is an experiential, hands-on activity designed to reinforce core computer systems concepts through applied practice. Students will participate in a guided, hackathon-style experience focused on assembly programming and system-level thinking.

The project emphasizes how high-level program behavior maps to low-level execution, including instruction flow, memory usage, and control logic. Students will demonstrate technical implementation and conceptual understanding through code, documentation, and reflection.

Deliverables may include assembly code, system diagrams, written explanations, and a short reflection on design decisions and lessons learned. A detailed project prompt and grading rubric will be provided.

Final Exam

The final exam is cumulative and assesses comprehensive understanding of the computer systems concepts covered throughout the course. It emphasizes synthesis and application across instruction execution, memory systems, data representation, and logic design.

The exam may include analysis of complete MIPS programs, interpretation of memory contents under different endian conventions, evaluation of assembler and loader behavior, Boolean logic simplification, and reasoning about system-level tradeoffs

✓ Grading Information

Component	Weight
Participation / Project / Homework / Discussions	15%
Quizzes (average of all)	20%
Midterm I	15%
Midterm II	15%
Final Exam	15%
Final Project (Experiential Learning)	20%
Total	**100%**

Extra Credits: No extra credit or make-up credits.

Your overall grade is calculated as the sum of the weighted assessment components above. No curve will be added to an individual component. If necessary, the instructor may curve overall course grades.

Letter-Grade Scale

A+ = 97–100
A = 94–96
A- = 90–93
B+ = 87–89
B = 84–86
B- = 80–83
C+ = 77–79
C = 74–76
C- = 70–73
D+ = 67–69
D = 64–66
D- = 60–63
F = below 60

The grade earned in each component is calculated as a percentage. The component percentage multiplied by its weight produces the weighted score. The sum of all weighted scores determines the final course percentage and letter grade.

Attendance for the first two class meetings is mandatory. Absence from either meeting may result in being dropped from the class.

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

Day	Date	Lecture Notes / Activities / Deliverables
Thu	08/20	Syllabus Overview; Course Introduction
Tue	08/25	Computer Systems in the Real World; System Programming Overview
Thu	08/27	Computer Organization & Architecture
Tue	09/01	Number Representation & Data Types
Thu	09/03	Compilation Flow: Assembler, Linker, Loader
Tue	09/08	Assembler, Linker, Loader (continued)
Thu	09/10	Introduction to Assembly Programming
Tue	09/15	Assembly Programming: Deep Dive
Thu	09/17	**MIPS Assembly: Arithmetic & Logic Instructions - Quiz 1 (in class)**
Tue	09/22	Memory Usage I
Thu	09/24	Memory Usage II
Tue	09/29	Comparison, Branch & Jump Instructions
Day	**Date**	**Lecture Notes / Activities / Deliverables**
Thu	10/01	Short Topic
Tue	10/06	Procedure Calls
Thu	10/08	Example printf Procedure Call (in person)
Tue	10/13	**REMOTE (asynchronous via Canvas) - Boolean Algebra I**
Thu	10/15	**REMOTE - Quiz 2 via Canvas + Midterm I Review**

Tue	10/20	REMOTE (asynchronous via Canvas) - Boolean Algebra I (continued)
Thu	10/22	Midterm I Exam (in class)
Tue	10/27	Boolean Algebra II
Thu	10/29	Logic Gates - Quiz 3 (in class)
Tue	11/03	Addition / Subtraction Logic
Thu	11/05	Addition / Subtraction Logic (continued)
Tue	11/10	Multiplication Logic
Day	Date	Lecture Notes / Activities / Deliverables
Thu	11/12	Floating-Point Number Representation
Tue	11/17	Midterm II Exam (in class)
Thu	11/19	Division Logic
Tue	11/24	Exceptions & Interrupts
Thu	11/26	Thanksgiving Holiday - NO CLASS
Tue	12/01	Final Project Launch + Guided Setup (Experiential Learning)
Thu	12/03	Final Project Working Session + Course Wrap-Up
Mon	12/07	Last Day of Instruction - no regular class meeting
Tue	12/08	Study/Conference Day - no classes or exams
Tue	12/15	Final Exam - 1:00-3:00 PM (University Scheduled) Location: Regular classroom unless otherwise assigned