SJSU SAN JOSÉ STATE UNIVERSITY

College of Science · Computer Science

Introduction to Computer Systems

CS 47

Spring 2026 Section 02 In Person 3 Unit(s) 01/22/2026 to 05/11/2026 Modified 01/16/2026

Contact Information

Office hours (required prior email appointment)

Monday 3.30PM to 4.30PM | Tuesday 4.15PM to 5.15PM

Seshadri Paravastu

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Course Information

Wed, Jan 21: Last Day to Drop for 100% Refund

Mon, Feb 2: Waitlist Ends

Tue, Feb 17: Last Day to Drop Classes without a "W" Grade via MySJSU

Lecture

- Tu and Thu
- 1:30PM - 2:45PM | MacQuarrie Hall 223

Jan 22 – May 11, 2026

Course Description and Requisites

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, Forensic Science: Digital Evidence.
Grading: Letter Graded.

Classroom Protocols

Classroom Protocol

(Computer Science – MacQuarrie Hall)

This course follows **San José State University classroom conduct and academic integrity policies**. To maintain a professional and productive learning environment, the following classroom 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
  - In-class coding or exercises
- Use of devices for unrelated activities (social media, browsing, messaging, etc.) 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 and 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 per 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 Materials

Required Texts/Readings

COMPUTER ORGANIZATION and DESIGN | Edition: 5

Author: DAVID A. PATTERSON

ISBN:9780124077263

Publication Date:10/10/2013 Publisher:ELSEVIER

Other Readings

Logic & Computer Design Fundamentals 5th Edition

ISBN 9780133760637

Author(s): M. Morris R. Mano; Charles R. Kime; Tom Martin

Publisher: PEARSON

Grading Information

This course follows weighted grading with weights for the course deliverables components, as follows:

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 a sum of all assessment elements mentioned above. No curve will be added to an individual element. If necessary, I will curve the overall grades.

For this class, overall grades are converted to letter grades as follows:

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

Grade earned in every component above will be calculated as a percentage, and the grade percentage * weight gives you the weighted score for that component. Total of all weighted scores for individual components will give you the weighted score for the course. Your final letter grade will be based on this weighted score.

Attendance for the first 2 classes is mandatory, absence for either will lead to being dropped from the class.

Breakdown

Quizzes

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

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

Questions may include multiple-choice, short answer, matching, and brief problem-solving items that require students to reason about how systems behave at the instruction, memory, or logic level. Students are expected to understand *why* an answer is correct, not just recall facts.

Midterm Exams

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

Exam questions may require students to analyze MIPS assembly programs, reason about register usage and calling conventions, interpret memory layouts and data alignment, evaluate assembler directives and pseudo-instructions, and perform numeric and logical transformations.

Students are expected to demonstrate clear reasoning, accuracy in calculations, and a solid understanding of how instructions execute within a processor and memory system.

Final Project (20%) – Experiential Learning Project

The Final Project is an experiential, hands-on project 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 understanding how high-level program behavior maps to low-level execution, including instruction flow, memory usage, and control logic. Students will demonstrate both 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.

Through this final project, you will be able to:

- Apply assembly programming concepts to solve system-level problems
- Analyze how instructions, memory, and control flow interact in a running program
- Communicate technical ideas clearly using code, diagrams, and written explanation
- Develop confidence working with low-level abstractions common in computer systems

Final Exam

The final exam is cumulative and assesses students' comprehensive understanding of computer systems concepts covered throughout the course. It emphasizes synthesis and application, requiring students to reason 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.

Students should be prepared to trace code execution, analyze how data moves through registers and memory, and explain system behavior using appropriate technical terminology.

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

CS 47-02 (28797) — Course Schedule

Intro to Computer Systems (Seminar)
Tu / Th 1:30–2:45 PM | MacQuarrie Hall 223
Jan 22 – May 11, 2026
Subject to change with or without notice.

Day	Date	Lecture Notes / Activities / Deliverables
Thu	01/22	Syllabus Overview, Course Introduction
Tue	01/27	Computer Systems in the Real World; System Programming Overview
Thu	01/29	Computer Organization & Architecture
Tue	02/03	Number Representation & Data Types
Thu	02/05	Compilation Flow: Assembler, Linker, Loader
Tue	02/10	Assembler, Linker, Loader (continued)
Thu	02/12	Introduction to Assembly Programming
Tue	02/17	Assembly Programming: Deep Dive
Thu	02/19	MIPS Assembly: Arithmetic & Logic Instructions — **Quiz 1 (in class)**

Day	Date	Lecture Notes / Activities / Deliverables
Tue	02/24	Memory Usage I
Thu	02/26	Memory Usage II
Tue	03/03	Comparison, Branch & Jump Instructions
Thu	03/05	Short Topic — **Quiz 2 (in class)**
Tue	03/10	Procedure Calls
Thu	03/12	Example `printf` Procedure Call
Tue	03/17	Boolean Algebra I
Thu	03/19	**Midterm I Exam (in class)**
Tue	03/24	Boolean Algebra I
Thu	03/26	Boolean Algebra II
Tue	03/31	**Cesar Chavez Day — NO CLASS**
Thu	04/02	**Spring Recess — NO CLASS**
Tue	04/07	Logic Gates
Thu	04/09	Presentation Day — **Quiz 3 (in class)**
Tue	04/14	Addition / Subtraction Logic
Thu	04/16	Addition / Subtraction Logic (continued)
Tue	04/21	Multiplication Logic
Thu	04/23	Floating Point Number Representation
Tue	04/28	**Midterm II Exam (in class)**
Thu	04/30	Division Logic
Tue	05/05	Exceptions & Interrupts
Thu	05/07	Final Project Launch + Guided Setup (Experiential Learning)

Day	Date	Lecture Notes / Activities / Deliverables
Mon	05/11	*Final Project Working Session + Course Wrap-up* — Last Day of Instruction
Thu	05/19	Final Exam — 1:00–3:00 PM (University Scheduled) Location: Regular classroom unless otherwise assigned