San José State University
Department of Computer Science
CS147 Capstone

- Appreciate the need to use a memory hierarchy and understand how locality of memory referencing in typical programs can be leveraged to perform effective memory architecture management
- Understand and emulate the various mapping, replacement, and dynamic memory allocation algorithms for cache and virtual memory management
- Understand the rationale and philosophy behind both complex instruction set computers (CISC) and reduced instruction set computers (RISC), and the tradeoffs between the two architectures.
- Understand how pipelining and parallel processing are cost-effective methods of increasing hardware performance
- Appreciate how computer-aided design tools and hardware description languages can be used to verify and measure the performance of hardware designs

BS in Computer Science Program Outcomes Supported

These are the BSCS Program Outcomes supported by this course.

- An ability to apply knowledge of computing and mathematics to solve problems
- An ability to analyze a problem, to identify and define the computing requirements appropriate to its solution
- An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
- An ability to use current techniques, skills, and tools necessary for computing practice
- An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices

Academic Integrity

You may study together and discuss the assignments, but what you turn in must be your individual work. Copying code from another student's program or sharing your program code are equally serious violations of academic integrity. Never use code you find on the web, unless you have the instructor's permission, and then you must give proper attribution in your comments. This is similar to giving attribution to a quote that you use in a term paper. Assignment submissions will be checked for plagiarism using Moss from the Department of Computer Science at Stanford University. See http://theory.stanford.edu/~aiken/moss/. Violators of academic integrity will suffer severe sanctions, including academic probation. Students who are on academic probation are not eligible for work as instructional assistants in the university or for internships at local companies.

Recommended Texts

LOGIC & COMPUTER DESIGN FUNDAMENTALS Author: MANO & KIME ISBN: 9780131989269 Publication Date: 06/15/2007 Publisher: PEARSON

COMPUTER ORGANIZATION and DESIGN | Edition: 5 Author: DAVID A. PATTERSON ISBN:9780124077263 Publication Date:10/10/2013 Publisher:ELSEVIER

Software to Install

Later in the semester, we will be using VHDL. At that time, you will need to install a VHDL simulator, such as GHDL, on your computer. To view the output, you will also need to install a viewer such as GTKWave.

Course requirements and assignments

There will be homework assignments and exams.

Assignments

There will be multiple homework assignments throughout the semester. Each assignment will be worth a specified maximum number of points. Assignments can be turned in within 48 hours late for 20% deduction. After 48 hours, no submission is allowed (it will get a 0 score).

Exams

All exams are open-book. You can refer to all class material. However, you may not communicate with any other person, or search solutions on the Internet. The exams will test understanding (not memorization) of the material taught during the semester. Instant messaging, e-mails, texting, tweeting, file sharing, or any other forms of communication with anyone else during the exams will be strictly forbidden. There can be no make-up exams unless there is a documented medical emergency.

The university's syllabus policies

- University Syllabus Policy S16-9 at http://www.sjsu.edu/senate/docs/S16-9.pdf
- Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/

"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 3 hours per unit per week with 1 of the hours used for lecture) for instruction or preparation/studying or course related activities including but not limited to internships, labs, clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus."

Grading Information

Your final class grade will be weighted as follows:
Homework Assignments: 40%
3 Exams: 60%

Final score to letter grade conversion is as follows:

Overall	Grad

6	3/8/2021	3/10/2021
	Datapath	ALU, Shifter
7	3/15/2021	3/17/2021
	Control Word	Instruction Set Architecture
8	3/22/2021	3/24/2021
	Floating Point	Control
9	3/29/2021	3/31/2021
	Spring Break	Spring Break
10	4/5/2021	4/7/2021
	Pipeline	RISC
11	4/12/2021	4/14/2021
	Review	Exam 2
12	4/19/2021	4/21/2021
	Hazards	CISC, Parallelism
13	4/26/2021	4/28/2021
	Memory and Caches	Cache Replacement Policies
14	5/3/2021	5/5/2021
	Virtual Memory	Multiplication
15	5/10/2021	5/12/2021
	I/O	Review
16	5/17/2021	