SAN JOSE STATE UNIVERSITY
DEPARTMENT OF ELECTRICAL ENGINEERING
Course Information (Green Sheet)

COURSE: EE275 - Advanced Computer Architecture
Lecture – Mon, Wed, 6pm-7:15pm, ENG341
Jan. 24 - May 14

GIVEN BY: Professor Chang "Charles" Choo, ENG 253, 924-3980,
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PREREQUISITE: Basic computer organization and logic circuits; Hardware Description Language (Verilog or VHDL) (optional); Assembly language programming (desirable); High-level programming language (C/C++/Python/Matlab/Simulink) (desirable).

TEXTBOOK: D.A. Patterson and J.L. Hennessy, *Computer Architecture: A Quantitative Approach,* Morgan Kaufman, current ed.

REFERENCES: To Be Distributed

WEB SITE: Class information, course materials including lecture notes, homework problems and solutions, notices, and FAQs (selected course-related e-mails between students and Prof. Choo) will be e-mailed to each student. Canvas will keep student progress record.

EVALUATION: The weighting among exams, term project, and assignments will be:

Midterm	20%
Final	35%
Homework/Quiz	15%
3 miniProjects (TBA)	30%

EXAMS: There will be a midterm exam and a final exam (see the tentative schedule attached for date/time), both of which will be closed-book and closed-note, with one two-sided cheat sheet allowed. No computer, tablet/pad, or cell phone will be allowed.

OFFICE HOURS: If you need help of the instructor, see him right after class or during his office hours (Tue, 1pm-2pm, Wed. 5pm-6pm). Use of e-mail is strongly recommended for other times, although appointments may be made for mutually convenient times.

MINI-PROJECTS: There will be three mini-projects; arithmetic pipeline design, instruction pipeline design with forward chaining and other advanced feature(s), and a literature survey of current state-of-the-art computer architectures. More details will be distributed in class at due time.

HOMEWORKS: 4-6 homework assignments will be distributed.

Tentative Schedule

Mini-projects:

1	Pipelined Floating-Point Adder Design (Due: 2/28)
2	Instruction Pipeline Design (Due:4/2)
3	Literature Survey of Current State-of-the-Art Computer Architectures (Due:5/9)

Class:

Lecture	Date	Topic
1	1/24	Introduction,
2	1/29	Arithmetic Circuit Review
3	1/31	IEEE Floating-point arithmetic circuits
4	2/5	History of Computing
5	2/7	Instruction set architecture
6	2/12	Addressing modes and instruction format, control sequencing
7	2/14	Instruction pipeline
8	2/19	Performance measures
9	2/21	Memory hierarchy, memory organization
10	2/16	Cache memory design parameters
11	2/28	Cache memory system design
12	3/5	Virtual memory
13	3/7	Pipeline hazards, ILP
	3/12	*Midterm, in-class*
14	3/14	Forward chaining, branch prediction
15	3/19	Loop unrolling and software pipeline
16	3/21	DLP, Vector processor
17	4/2	Memory interleaving
18	4/4	Array processor
19	4/9	Multiprocessor and TLP
20	4/11	Cache coherence, MESI protocol
21	4/16	GPU architecture
22	4/18	GPU and CUDA
23	4/23	Heterogeneous computing
24	4/25	Warehouse-Scale Computers, Data Center
25	4/30	Request-Level Parallelism (RLP)
26	5/2	Embedded system
27	5/7	AI/Machine Learning architecture and DNN
28	5/9	DNN (cont'd)
	5/16	*Final Exam (Comprehensive, 1715-1930)*

PLEASE DO NOT CONSUME FOOD IN THE CLASSROOM

EE@SJSU
Honesty and Respect for Others and Public Property

EE HONOR CODE

The Electrical Engineering Department will enforce the following Honor Code that must be read and
accepted by all students.
"I have read the Honor Code and agree with its provisions. My continued enrollment in this course
constitutes full acceptance of this code. I will NOT:

- *Take an exam in place of someone else, or have someone take an exam in my place*
- *Give information or receive information from another person during an exam*
- *Use more reference material during an exam than is allowed by the instructor*
- *Obtain a copy of an exam prior to the time it is given*
- *Alter an exam after it has been graded and then return it to the instructor for re-grading*
- *Leave the exam room without returning the exam to the instructor."*

Measures Dealing with Occurrences of Cheating

- *Department policy mandates that the student or students involved in cheating will receive an "F" on*
  that evaluation instrument (paper, exam, project, homework, etc.) and will be reported to the Department and the University.
- *A student's second offense in any course will result in a Department recommendation of suspension*
  from the University.

EE HONOR CODE

In addition to EE Honor Code, EE118 students understand that professional attitude is necessary to
maintain a comfortable academic environment. For examples:

- *I do not just skip the lecture and then ask the instructor to summarize the lecture for me later on.*

Office hours are for students to have questions, not for the instructor to summarize the lecture for any
specific student.

- *I come to the class on time and leave the class at the end of the lecture.*
- *To minimize possible tension during the exams, I WILL follow the exam rules closely.*
- *I work on the lab assignments and final project by myself.*
- *I understand that long-term learning is my responsibility and so I always keep it up.*
- *I strongly believe that NOT any statement similarly to examples below can be used:*
- *I am working full-time and so do not have enough time for the class.*
- *I have quite many classes this semester and so I do not have enough time for the class.*
- *I just need a passing grade to graduate this semester.*
- *I live far away from the campus and so I can not come to the class often.*
- *etc., etc....*