Department of Electrical & Computer Engineering

CPE/EE 517-A Digital & Computer System Architecture

Fall 2021

Course Name:	Digital & Computer System Architecture
Credits:	3
Classroom:	Gateway North GN204
Class Hours:	Monday, 3:00 PM – 5:30 PM
Course Zoom Link:	https://sit.instructure.com/courses/49789/external_tools/86566
Office Hours:	Monday, 10:00 AM – 12:00 PM
Zoom Link for Office Hour:	https://sit.instructure.com/courses/49789/external_tools/86566
Instructor:	Hang Liu
Office:	Burchard 307B
Phone:	(201) 216-8103
Email:	hliu77@stevens.edu
TA:	Mingju He
Office hour:	Tuesday,10:00 AM – 12: 00 PM
	https://sit.instructure.com/courses/49789/external_tools/86566
Office:	Burchard 414
Email:	mhe6@stevens.edu (You can always send TA email for help)

Textbook

Computer Architecture: A Quantitative Approach, John L. Hennessy and David A. Patterson, Morgan Kaufmann, 6th edition, 2017.

Materials

All other materials and slides will be uploaded to course website.
https://sit.instructure.com/courses/49789/modules

Prerequisite Course and Knowledge

- C
- Assembly Programming

Course Description

This class covers advanced topics in computer architecture and design, including instruction-level parallelism, thread-level parallelism, memory, multithreading, and storage systems.

Learning Objectives

The objectives are to

- Study quantitative approach for computer architecture design
- Clearly understand the memory hierarchy
- Learn the instruction set architecture, and instruction level parallelism

- Clearly understand thread-level parallelism
- Understand data level parallelism and warehouse-scale computing

Format and Structure

This course is comprised of weekly lectures, homework, labs, midterm, and final exams.

Course Requirements

Attendance. Students are required to attend all lectures. Four random attendance signoffs will be performed. Each student is permitted one absence per semester without penalty. Excused absences (religious or medical, noted in via email to the professor prior to the absence occurring) accompanied by proper documentation will not lead to point deductions. **50 points possible**.

Homework and Labs. There will be four (4) homework assignments and two (2) labs for this semester. Each assignment counts for 100 points and each lab counts for 50 points.5 points will be deduced each day after the due date. All assignments are due in class on Monday. Students are required to honor the Stevens Code of Academic Integrity (Undergrad and Graduate) when completing all assignments, labs, and examinations. **500 points possible.**

Exams. There will be one mid-term exam and final exam for this course; midterm exam counts for 200 points and final exam counts for 250 points. Note, there is no makeup exam. Excused absence from any exam shall seek consent from the instructor before the exam day; rearrangement can be scheduled only if a student has a physical problem evidenced by the Doctor's prescription. **450 points possible.**

Course format. Digital & Computer System Architecture are practical subjects. This course will also find an effective way to help every student understand this course.

Grading Procedures

Grades will be based on:

- Attendance (5 %) 50 points
- Homework & Labs (50 %) 500 points
- Exams (45%) 450 points

Grade breakdown

A (>=90%),
A- (86 – 89.9%),
B+ (80 – 85.9%),
B (75 – 79.9%),
B- (70 – 74.9%),
C+ (67 – 69.9%),
C (63 – 66.9%),
C- (60 – 62.9%),
F (<60%).

Tentative Course Schedule

The following is a tentative course schedule. Any changes to this schedule will be communicated to students via Email/Canvas.

Week	Date	Topic	Note	
Week 1	8/30	Course overview & Introduction	Ch 1	
Week 2	9/6	Labor Day – no class		
Week 3	9/13	Introduction	Ch 1	HW1 out
Week 4	9/20	Pipelining and ISA	Appendix A & C	HW1 due Lab1 out
Week 5	9/27	Pipelining and ISA	Appendix A & C	HW2 out
Week 6	10/4	Review of memory hierarchy	Appendix B	Lab1 due Lab2 out
Week 7	10/12	Memory hierarchy design	Ch 2	HW2 due
Week 8	10/18	ILP	Ch 3	
Week 9	10/25	ILP	Ch 3	
Week 10	11/1	Mid-term exam		
Week 11	11/8	DLP	Ch 4	HW3 out Lab2 due
Week 12	11/15	TLP	Ch 5	HW3 due
Week 13	11/22	TLP	Ch 5	HW4 out
Week 14	11/29	Advanced topics: WSC &GPU	Ch 6 & 7	HW4 due
Week 15	12/6	Final exam		

Academic Integrity

All Stevens graduate students promise to be fully truthful and avoid dishonesty, fraud, misrepresentation, and deceit of any type in relation to their academic work. A student's submission of work for academic credit indicates that the work is the student's own. All outside assistance must be acknowledged. Any student who violates this code or who knowingly assists another student in violating this code shall be subject to discipline.

All graduate students are bound to the Graduate Student Code of Academic Integrity by enrollment in graduate coursework at Stevens. It is the responsibility of each graduate student to understand and adhere to the Graduate Student Code of Academic Integrity. More information including types of violations, the process for handling perceived violations, and types of sanctions can be found at www.stevens.edu/provost/graduate-academics.

Learning Accommodations

Stevens Institute of Technology is dedicated to providing appropriate accommodations to students with documented disabilities. The Office of Disability Services (ODS) works with undergraduate and graduate students with learning disabilities, attention deficit-hyperactivity disorders, physical disabilities, sensory impairments, psychiatric disorders, and other such disabilities in order to help students achieve their academic and personal potential. They facilitate equal access to the educational programs and opportunities offered at Stevens and coordinate reasonable accommodations for eligible students. These services are designed to encourage

independence and self-advocacy with support from the ODS staff. The ODS staff will facilitate the provision of accommodations on a case-by-case basis.

Disability Services Confidentiality Policy

Student Disability Files are kept separate from academic files and are stored in a secure location within the Office of Disability Services. The Family Educational Rights Privacy Act (FERPA, 20 U.S.C. 1232g; 34CFR, Part 99) regulates disclosure of disability documentation and records maintained by Stevens Disability Services. According to this act, prior written consent by the student is required before our Disability Services office may release disability documentation or records to anyone. An exception is made in unusual circumstances, such as the case of health and safety emergencies. For more information about Disability Services and the process to receive accommodations, visit https://www.stevens.edu/office-disability-services. If you have any questions please contact: Phillip Gehman, the Director of Disability Services Coordinator at Stevens Institute of Technology at pgehman@stevens.edu or by phone (201) 216-3748.

Inclusivity

Name and Pronoun Usage. As this course includes group work and in-class discussion, it is vitally important for the class to create an educational environment of inclusion and mutual respect. This includes the ability for all students to have their chosen gender pronoun(s) and chosen name affirmed. If the class roster does not align with your name and/or pronouns, please inform the instructor of the necessary changes.

Inclusion Statement. Stevens Institute of Technology believes that diversity and inclusiveness are essential to excellence in academic discourse and innovation. In this class, the perspective of people of all races, ethnicities, gender expressions and gender identities, religions, sexual orientations, disabilities, socioeconomic backgrounds, and nationalities will be respected and viewed as a resource and benefit throughout the semester. Suggestions to further diversify class materials and assignments are encouraged. If any course meetings conflict with your religious events, please do not hesitate to reach out to your instructor to make alternative arrangements. Students in this class are expected to treat your instructor and all other participants in the course with courtesy and respect. Disrespectful conduct and harassing statements will not be tolerated and may result in disciplinary actions.

Questions to Your Grades

You may request the instructor to reevaluate your homework, examinations, course project, and other course materials if you have any question to your course grade. Written request must be submitted to the instructor within two (2) calendar days after the grade was assigned.

Other ways to connect to the class

Topic: Fall21: CPE/EE 517-A Digital & Computer System Architecture
Time: This is a recurring meeting Meet anytime

Join Zoom Meeting
https://sit.instructure.com/courses/49789/external_tools/86566
Meeting ID: 953 8301 0913
One tap mobile
+19292056099,,95404536853# US (New York)
+13017158592,,95404536853# US (Washington DC)

Dial by your location
+1 929 205 6099 US (New York)
+1 301 715 8592 US (Washington DC)
+1 312 626 6799 US (Chicago)
+1 669 900 6833 US (San Jose)
+1 253 215 8782 US (Tacoma)
+1 346 248 7799 US (Houston)
Meeting ID: 954 0453 6853
Find your local number: https://stevens.zoom.us/u/aJfcIzf4O

Join by SIP
95404536853@zoomcrc.com

Join by H.323
162.255.37.11 (US West)
162.255.36.11 (US East)
221.122.88.195 (China)
115.114.131.7 (India Mumbai)
115.114.115.7 (India Hyderabad)
213.19.144.110 (Amsterdam Netherlands)
213.244.140.110 (Germany)
103.122.166.55 (Australia)
209.9.211.110 (Hong Kong SAR)
149.137.40.110 (Singapore)
64.211.144.160 (Brazil)
69.174.57.160 (Canada)
207.226.132.110 (Japan)
Meeting ID: 954 0453 6853