

## Course Information

Course Number: CSCE 469

Course Title: Computer Architecture

Section:

Time: 02:20 pm-03:35 pm on Tuesday and Thursday

Location: 113 Bright Building

Credit Hours: 3

## Instructor Details

Instructor: Eun Jung Kim

Office: 215 Peterson Building

Phone: 845-3660

E-Mail: [ejkim@tamu.edu](mailto:ejkim@tamu.edu)

Office Hours : 03:35-4:00 pm on Tuesday and Thursday (Zoom links on Canvas)

TA: Sungkeun Kim

Office: 261 Peterson Building

Email: [ksungkeun84@tamu.edu](mailto:ksungkeun84@tamu.edu)

Office Hours: Monday 4:30-5:30, Friday 1:00-2:00 (Zoom links on Canvas)

## Course Description

*Reviews of von Neumann architecture and its limitations; parallel computer structures and concurrent computation; pipeline computers and vectorization methods; array processors, multiprocessor architectures and programming; dataflow computers.*

## Course Prerequisites

*CSCE 350 or CSCE312. An undergraduate computer engineering or computer science background is expected.*

## Special Course Designation

*No special Designation*

## Course Learning Outcomes

*The main objective of this course is to provide an opportunity for students to learn about computer architecture with an emphasis on microprocessor microarchitecture. Upon successful completion of the course, a student will be able to:*

- *Understand microarchitecture of modern computing systems*
- *Understand how software and hardware cooperate to run programs*

- *Design hardware enhancements to improve the performance and analyze the performance of different implementations*

## Textbook and/or Resource Materials

*Instructor will provide copies of lecture slides, and links to resources on the internet.*

*Textbook: Computer Architecture: A Quantitative Approach, Sixth Edition by John L. Hennessy and David A. Patterson*

## Grading Policy

### *Grading Scale*

#### *Standard Letter Grading Scale:*

*A = 90-100%*

*B = 80-89%*

*C = 70-79%*

*D = 60-69%*

*F = <60%*

*The course consists of lectures, reading, homework, project and exams. The grade will be computed as follows:*

*Midterm            25 %*

*Final Exam        25 %*

*Term Project      25 %*

*Homework & Class Participation 25 %*

*Exams: The midterm examination will be held on Monday, October 18 from 4:00-5:30 pm. The final examination will be held on Monday, December 13 from 3:30–5:30 pm following the University schedule. The exams will cover all material up to that point, so you are responsible for mastering all homework material. All exams will be closed book and closed notes (unless otherwise stated).*

*In the case of schedule conflict, please contact the instructor to arrange a makeup exam time.*

*Documentation will be required for any make-up exams, and must be arranged **two weeks in advance**. No last-minute accommodations will be made.*

*Assignments: Homework will be assigned as lecture topics are completed. Reading assignments will be assigned associated with lecture topics.*

*Assignments will be released on the canvas. The correct approach is to start working on assignments as early as possible and contact the instructor or TA when you encounter difficulties. In general, the closer to the deadline you request our assistance, the harder it may be to obtain our help.*

*Submission of Work: All assignments deliverables must be submitted electronically, by the due date, through Canvas (unless otherwise specified). Late assignments are not going to be accepted in general,*



unless a University sanctioned excuse is provided ahead of time. A student will earn points when he/she submits the assignment on time, by the partial credit policy. Note that email submissions will not be accepted (they will be ignored without notice). You have to follow the submission and media policies and guidelines published on the web.

**Re-grading Policy:** A student can request re-grading of assignments and exams, if he/she believes that the points assigned are inconsistent with the quality and merits of the submitted work. To request re-grading you have to follow the guidelines below.

1. Regrading requests must be submitted AT MOST ONE WEEK AFTER the item has been graded and returned to the student and solutions have been made public. After this time limit NO re-grading requests will be honored.
2. Re-grading requests must be as specific as possible and must be accompanied by a reasonable amount of justification and documentation. Requests must be in written form for major assignments and exams.
3. E-mails must be sent to TAs and graders or the instructor within the one week time limit.

### Late Work Policy

Late work will not be accepted in general. Turn in all work by the established deadline. In case you have difficulties finishing an assignment, contact the TA or the instructor before the deadline. Late work can be accepted only under documented circumstances beyond the student's control and if possible by prior arrangement with the Instructor.

### Course Schedule

Week	Topic	Readings for Next Time	Out	In (Due)
1-2	Introduction & Chap. 1/App.A	Chapter 1, Appendix A	HW1	
3	App. C	Appendix C		HW1
4	Chap. 3 ILP- Branch Predictor	Chapter 3	HW2	
5-6	Chap. 3 ILP - Scheduling	Chapter 3		
7	Chap.3 ILP-Hardware Speculation	Chapter 3	Project Proposal HW3	HW2
8	Midterm, App.B	Appendix B		HW3
9	Chap. 2 Memory Basics/App.B	Chapter 2	HW4	Proposal
10	Chap. 2 Memory Optimization	Chapter 2		
11	Chap. 2 TLB/Vitual Memory	Chapter 2		
12	Chap. 4 SIMD	Chapter 4		HW4
13	Chap. 4 SIMD-GPU	Chapter 4	HW5	
14	Chap. 5 TLP	Chapter 5		
15	Chap. 5 Cache Coherence	Chapter 5		HW5
16	Final : Dec. 13 3:30 – 5:30 p.m.			Term Paper

## Optional Course Information Items

N/A

## University Policies

### Attendance Policy

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to [Student Rule 7](#) in its entirety for information about excused absences, including definitions, and related documentation and timelines.

### Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to [Student Rule 7](#) in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" ([Student Rule 7, Section 7.4.1](#)).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" ([Student Rule 7, Section 7.4.2](#)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See [Student Rule 24](#).)

### Academic Integrity Statement and Policy

"An Aggie does not lie, cheat or steal, or tolerate those who do."

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" ([Section 20.1.2.3, Student Rule 20](#)).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at [aggiehonor.tamu.edu](http://aggiehonor.tamu.edu).

## Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit [disability.tamu.edu](http://disability.tamu.edu). Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

## Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see [University Rule 08.01.01.M1](#)):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, you will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with [Counseling and Psychological Services](#) (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's [Title IX webpage](#).

## Statement on Mental Health and Wellness

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Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in proper self-care by utilizing the resources and services available from Counseling & Psychological Services (CAPS). Students who need someone to talk to can call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at [suicidepreventionlifeline.org](https://suicidepreventionlifeline.org).