

CS4290/CS6290/ECE4100/ECE6100 High-Performance Computer Architecture

Fall 2012

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Instructor: [Prof. Hyesoon Kim](#)

Email: hyesoon at cc dot gatech dot edu

Office hours: Tu 1:00-1:30, Th 3:00-3:30

Office: KACB 2344

Class time: Tu/Th 1:30-3:00

Class room: KACB 1447

TA office hours: Please see [the homework homepage](#) to get the TA information.

Announcements

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Course Description

This is a graduate-level course on how the computer works. In this course, we will review fundamental structures in modern microprocessor and computer system architecture design. We will cover computer organization, instruction set design, memory system design, pipelining, cache coherence protocols, memory schedulers, power/energy, prefetching and other techniques to explore instruction level parallelism and thread level parallelism. We will also cover system level topics such as storage subsystems. We will also have case studies as to how modern microprocessors are designed.

Text book:

No required text book.

Recommended books

Computer Architecture: A Quantitative Approach, 5th Edition by John Hennessy and David Patterson (H&P).

Microprocessor architecture, Jean-Loup Baer, Cambridge.

Papers (see [Reading](#).)

Course Policies

- **Grading for undergraduate students**

5% Pop Quizzes and Class participation

35% 5 assignments: 1st (5%), 2nd (10 %), 3rd (5 %), 4th (5%), 5th (10%)

17.5% Midterm-I

17.5% Midterm-II

25% Final Exam (Comprehensive)

- **Grading for graduate students**

- Option 1: Finals Track**

- 5% Pop Quizzes and Class participation

- 10% Paper survey

- 30% 4 assignments: 1st (5%), 2nd (10%), 3rd (7.5%), 4th (7.5%)

- 15% Term project

- 12.5% Midterm-I

- 12.5% Midterm-II

15% Final Exam

Option 2: Research Track

5% Pop Quizzes and Class participation

10% Paper survey

30% 4 assignments: 1st (5%), 2nd (10%), 3rd (7.5%), 4th (7.5%)

30% Research project

12.5% Midterm-I

12.5% Midterm-II

- **Final grade algorithm (Tentative)**

90 ~ 100 (out of 100): A

75 ~ 90 B

65 ~ 75: C

55 ~ 65: D

Below 55%: F

- **Homework and programming assignments**

I encourage you to study in groups. However, homeworks, examinations and your work on all programming assignments must be your own individual work. The paper survey and a term project can be a group project. Collaboration with other students or other persons is prohibited. Submitting any work other than your own is a violating of the Academic Honor Code. You can use code that are available in websites other than class homepages. If you are not sure what you can discuss or not, please contact the instructor.

- **Exams**

Absolutely no collaboration at all. Copying or receiving any other information from another person or their exam, with or without their consent, is unethical and unacceptable. Cheating is a direct violation of the GT Academic Honor Code and will be dealt with accordingly.

- **Homework and report late policy:** All homeworks assignments are due on the day specified by the problem set and posted online.

- **Programming assignment late policy:** All programming assignments are due on the day specified by the assignment description and posted online. To account for short-term unexpected events like computer crashes, submission problems, and clock skew, we will allow 5:55 hours of slack and accept projects until exactly (due time + 5 hr 55 m).

Projects received after the due date will lose 10% of the grade on the first late day, 20% on the second, and 40% on the third. Weekend days are counted in exactly the same way as weekdays (e.g., if the project deadline is Friday and you turn it in Sunday, that's two days late).

- **Programming assignment extension:** You can request an extension for programming assignments for up to 5 days without any penalty only once during the semester for special situations such as conference paper deadlines, interviews etc. You must request the extension 2 days before by e-mail. No late policy will be applied together if you request an extension.

- **Assignment submission rules:** You must follow the submission guidelines specified in the assignment description. We will use T-squares. Wrong file names, broken file formats, missing files will lose 20% of grade. For reports, you must turn in a hardcopy of your report during the class time.

- **Regrades:** TA will grade homework assignments. Regrades are obtained by submitting a written

explanation to the instructor within a week when the work was returned in class. Regrades will only be discussed after submitting the work in this manner. In order for a test to be re-graded, you must neatly state in writing the reason that you would like your test to be re-graded. If a test is submitted for a re-grade, I have the right to re-grade the entire test, so keep it mind that it is possible to lose additional points. Therefore, it is strongly recommended that you do not ask for a re-grade unless you have substantial reason to believe that I made a mistake when originally grading the test.

- **Class participation** We do not check attendance. You will get class participation points if (1) you ask many good questions during the class (2) you answer actively in on-line group discussions (3) PoP quiz (4) other creative ways.

Office Hours: Please respect the office hours of the instructor and TA by planning ahead. Other times are possible by appointments.

Student honor code: Zero tolerance toward a violation of the student honor code. Any misbehavior will be reported to Dean of Students directly.