

CSE34321 Computer Architecture I

Fall, 2016

Time: **Class:** Tuesday & Thursday, 3:45pm - 5:00pm (London time)
 Lab: Tues.: 5:15pm - 6:30pm (London time) (optional)

Instructor: **Dr. X. Sharon Hu**
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 Office Hours: Wed.: 2:00 - 3:00pm (London time) or by appointment

TA: **Kurt Davis**
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 Office Hours: same as Lab time

Sakai, Piazza: FA16-CSE-34321-01

Text: D.A. Patterson and J.L. Hennessy,
 Computer Organization and Design: The Hardware/Software Interface,
 5th edition, Morgan Kaufmann Publishers, ISBN 9780124077263

Course Overview and Objectives

This course provides students with a fundamental understanding of the basic topics in modern computer architecture. By the end of the semester, you are expected to be able to do the following:

- Describe the basic components required in a single core of a modern microprocessor as well as how they interact with one another, with main memory, and with external storage media.
- Suggest, compare, and contrast potential architectural enhancements by applying appropriate performance metrics.
- Apply fundamental knowledge about a processor's datapath, memory hierarchies, performance metrics, etc. to design a microprocessor such that it (a) meets a target set of performance goals and (b) is realistically implementable.
- Explain how code written in (different) high-level languages (like C, Java, C++, Fortran, etc.) can be executed on different microprocessors (e.g., Intel, AMD, etc.) to produce the result intended by the programmer.
- Use knowledge about a microprocessor's underlying hardware (or "architecture") to write more efficient software.
- Articulate the main architectural advances for improving computer performance and how they have impacted software development.

Course Policies and Procedures:

1. Lecture related:

- Each Tuesday/Thursday morning, the lecture notes for the day as well as the reading assignments for the following lecture will be posted.
- Attendance of lectures is required. Students are expected to do their reading assignments and participate in class discussions.

2. Exam related:

- There will be one midterm test and the final exam. The midterm test date is temporarily set to October 13 and the exact time will be announced later.
- Only under unusual circumstances (medical excuse or prior instructor approval) may make-up tests be considered. Otherwise, a zero point will be counted towards your grade.

3. Homework and lab assignment related:

- To prepare you better for the real world working environment which you will soon enter, assignments in this class will be accomplished by teams, unless otherwise instructed. For each team assignment, only one solution needs to be handed in by each team. *Please note that team-based assignments will usually be "bigger" than non-team-based ones.*
- On each team assignment, each team should designate a **coordinator** to make sure everyone understands who is supposed to be doing what¹, a **recorder** to prepare the final solution set, and a **checker** to check the final solution for correctness. *These roles should rotate on every assignment.* On each assignment, put the names and roles of the *participating* team members and the assignment number on a cover sheet. *If a student's name appears on a solution set, it certifies that he/she has participated in solving the problems.* Students whose names do not appear on a solution will receive zero point.
- Submission is done via Sakai's Assignments link. **Assignments should be turned in prior to the start of the class on the due date.** Assignments will be accepted up to three days after the due date. Late assignments will receive a deduction of 20% of the maximum grade for each additional day. *However*, if a student/team abuses this privilege by routinely handing in assignments late, the privilege will be withdrawn. Assignment solutions will be made available after the graded assignment is returned. **Please do not share the solutions with others.**
- For each team assignment, complete an "Individual Effort Rating for Team Members". (The form is available on Sakai.) Note that the ratings should reflect each individual's level of participation and effort and sense of responsibility, not his or her academic ability. These results may be used to adjust assignment grade for individual effort.

4. Grading Guidelines:

- Inquiries about graded assignments and the test will be accepted only if made **within one week** after they are handed back. Such inquiries should be made in writing, which clearly explains the complaints. Only after reviewing the written complaints, can the instructor make any grade adjustments.

¹Suggestion: Have each team member set up each problem individually, then get together to work on the details.

- Grade components:

Homework	20%
Class Participation	5%
Labs	30%
Midterm Test	20%
Final	25%

4. Honor Code:

- Notre Dame students are expected to abide by Academic Code of Honor Pledge. “As a member of the Notre Dame community, I will not participate in or tolerate academic dishonesty.” (<http://honorcode.nd.edu>)
- “All students must familiarize themselves with the Honor Code on the University’s website and pledge to observe its provisions in all written and oral work, including oral presentations, quizzes and exams, and drafts and final versions of essays”
- When in doubt about whether or not something is allowed or not, don’t assume that you are right – **check with me.**

An important note about using online resources, textbook solution manuals, and assignment solutions from previous and/or other courses:

- If you consult any online solution manual, homework solution guide, homework answers that have been posted from a prior course, any other online resource, etc. to solve a particular question, you must cite the source in your answer. [Please note that you do NOT need to cite any materials, i.e., lecture notes, board problem solutions, etc. that are posted on the course Sakai site – FA16-CSE-34321-01 – as these are obviously resources that are presented in class and that all students have access to.] **Failure to provide proper citation will be considered to be an honor code violation.**
- If your answer includes or matches excerpts of text, diagrams, etc. from an online solution manual, homework solution guide, homework answers that have been posted from a prior course, any other online resource, etc., and this material is not explicitly cited, this will be considered plagiarism and an honor code violation will ensue.

These policies are meant to reflect the guidelines in the Undergraduate Student Guide to the Academic Code of Honor¹. More specifically:

- “Academic integrity is incompatible with the following actions:
 - Submitting without citation work that incorporates someone else’s ideas; for example:
 - * Sentences copied, wholly or partially, from (i) a book, article, essay, or newspaper, (ii) another student’s paper, notebook, or exam, (iii) the Internet or any other written, printed, or media source, whether or not the material in question is copyrighted
 - * Statements paraphrased from written or printed media material, including websites
 - * Ideas lifted from books, essays, and websites that serve as unreferenced starting points, governing issues, illustrations, and the like.”

If in doubt as to what constitutes an acceptable resource, ask me first!