CS 250
Fall 2014 SYLLABUS

Instructor
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Graduate Teaching Assistants
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Purpose
This course covers all aspects of digital computer hardware, with the material divided into five parts:

2. Processors. Central Processing Unit (CPU); instruction sets; assembly language.
3. Memory. Physical and virtual memory systems; memory technologies; memory organization; caching.
4. Input/Output. Interconnection of computers and external devices; buses; device drivers.
5. Advanced Topics. Aspects of architecture including parallelism, power management, and hierarchy.

The course comprises both lecture-format classes to examine course topics and laboratory hands-on experience with digital circuits and assembly language programming.

Textbook

Grading Policy
Your grade is based on homework problems, in-class quizzes, in-class exams, a final exam, and laboratory problems and programming projects.

A grade will be computed as follows:

- 5%   Homework problems
- 5%   Quizzes
- 40%  Examinations (midterms and final)
- 50%  Laboratory problems and programming projects
Late Policy

There is no partial credit for late assignments, and this applies particularly to any lab assignments that are designated as “must be completed during lab”. However, each student will have 3 late days for the semester that can be applied to any project or spread among up to three projects. The only other exceptions will be for emergencies, such situations requiring instructor consultation and approval.

Tentative Schedule (15 weeks)

1. Introduction; motivation; fundamentals of digital logic; gates as basic building blocks.
2. Digital logic; data paths.
3. Data and program representation; endian order and effect on programming.
4. Processors: types; instruction sets and pipelined execution; vertical and horizontal microcode.
5. Processors: operand addressing and instruction representation; CPUs.
6. Assembly languages; programming paradigm; symbolic assemblers.
7. Memory and storage: technologies and basic organization.
8. Memory and storage: physical memories; access paradigm; physical memory addressing.
9. Memory and storage: virtual memory technologies; virtual addressing; caches and caching.
10. Input / Output: concepts and terminology; relative speeds; buses and bus architectures.
11. Input / Output: programmed and interrupt-driven I/O; a programmers; view of devices; I/O and buffering.
12. Hardware optimizations: parallelism; data pipelining.
13. Power and energy; assessing performance; multiprocessing.
15. Instructor-selected topics.

Changes for Emergencies

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances beyond the instructor’s control. If an emergency occurs, you can consult the Purdue web page (http://www.purdue.edu) as well as the class web page on Blackboard for information.