CS 355: Computer Architecture

Spring 2013

Studying computer architecture helps in understanding the software/hardware interface, selecting hardware, and optimizing system designs and implementation. We will focus on topics of processors, I/O, memory, and performance. This will culminate in a study of an energy efficiency system, including reviewing scientific papers and considering the societal implications of this new technology.

Instructor: Susan J Lincke, Ph.D **Email**: lincke@uwp.edu
Web Page: www.cs.uwp.edu/Classes/Cs355

Office Hours: Tues, Thurs. 5-6 PM
Wed. 1-4 PM or by appt.
Office Phone: (262) 595-2129
Office Location: MOLN 255

Class Hours: Tues, Thur. 3:30-4:52 PM **Class Location**: MOLN 130

Text: *Computer Organization and Design, 4th Ed.,* D A Patterson, J L Hennessy

Prerequisites: CS 245 Assembly Language

Homework Assignments: There will be 1 presentation on hardware topics, and three papers.

Grading:

- In-class lab/homework: 10%
- One Presentation (2@5%): 5%
- Three Papers (5%, 10%, 10%): 25%
- Three exams @ 20% each: 60%

Grading Scale: A= 90% B=80% C=70% D=60% F<60%
Plus grades are assigned for grades within 2% of the next higher grade.
Minus grades are assigned for grades with in 2% of the next lower grade.

Course Outline:

1. Introduction (Chapter 1 except 1.4)
2. The Processor: Datapath & Control (Chapter 4-4.4)
3. Pipelining (Chapters 4.5-4.11)
4. Intro to Security
5. I/O and Interfacing (Chapter 6.5-6.8)
6. Cache (Chapters 5-5.3, 5.8)
7. Disk & File Systems (Chapter 6-6.4, 6.9)
8. Energy Efficiency
9. Multicore & Multiprocessors (Chapter 7-7.7)
10. Performance Improvement (Chapter 1.4)

Due Dates: Exam dates and homework due dates are posted on my web page.

Graded Assignments:

Papers: Three papers will be written: one each on devices, hardware security and methods of energy efficiency. The papers have three goals:

- **Technology:** The energy efficiency topic will enable students to consider computer architecture as a system, including the interrelationship between multiple hardware components.
- **Continuing Professional Development:** Students will evaluate four professional papers as part of this assignment. This will entail observing how the scientific method was used.
- **Social Impact:** Students will also investigate the social and environmental implications of security and energy efficiency. This has implications on a local and global scale.

Presentation: A presentation will be on either a hardware security issue or energy efficiency related to computing. Grading will be on technical concepts, presentation organization, and presentation style.

Course Regulations:

Academic Honesty: Any indication of copying project work or any behavior during exams that could be considered copying or cheating will result in an immediate zero on the assignment or exam for all parties involved. In addition, the student's advisor/department will be notified. Cheating on assignments is defined to be copying from someone else or providing someone else copies of your answers. Do not show your assignments to anyone else! You may answer questions on labs or project homework asked by other students.

Exam Make-Ups: Prior notice must be given to me when an exam must be missed. No make-up exams will be granted unless satisfactory documentation is produced to show an extenuating circumstance.

Food in Class: Drinks are allowed in class. Food that is not loud and does not smell is allowed in class. Thus, for the benefit of your hungry neighbors, grilled food and potato chips are not allowed.

Students with a Disability: Any student with a documented disability who needs academic adjustments or accommodations is requested to speak with me during the first two weeks of class. Please bring your letter of verification from the Disability Services Office (WLLC D175 at 595-2372). All discussions will remain confidential.

Accommodation for Religious Observances: UW-Parkside policy requires that reasonable accommodation for a student's religious beliefs. Please notify your instructor

within the first two weeks of classes about any scheduled class date that conflicts with a religious observance.