CS 355: Computer Architecture

Spring 2016

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. For homework, students will study technologies of their interest, related to a hardware component, hardware security, and/or energy efficiency. Students will review scientific papers and consider the societal implications of these technologies.

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

Office Hours: Tues, Thurs. 12-2 PM   **Office Location**: MOLN 255
    Tues. 5-6 PM or by appt.

Class Hours: 01: Tues/Thur 3:30-4:52 PM   **Class Location**: MOLN 318
    02: Wed. 6:30-9:20 PM   **Class Location:** MOLN 318

Text: *Computer Organization and Architecture,* William Stallings

Prerequisites: CS 245 Assembly Language

Homework Assignments: There will be two papers and two presentations.

Grading:
In-class lab/homework:	10%	
On-line Quizzes	10%	
Two presentations @ 5%	10%	
Two papers @ 10%	20%	
Two exams @ 25% each:	50%	

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 & 2 except Performance)
2. The Processor & Multiprocessor
3. Pipelining (Chapter 14.4, 15.5, 15.6)
4. Superscalar (Chapter 16, 17)
5. Intro to Security
6. Energy Efficiency
7. I/O and Interfacing (Chapter 3, 7)
8. Cache (Chapter 4)
9. Disk & File Systems (Chapter 6)
10. Interrupts (Chapter 7)

11. Time Permitting: Networks (Appendix L)
Due Dates: Exam dates and homework due dates are posted on my web page.

Graded Assignments:

Homework:
- One lab report paper will be written evaluating the efficiency of parallel programming.
- One paper and two presentations will be completed on topics of devices, hardware security or energy efficiency. Presentation grading will be on technical concepts, presentation organization, and presentation style.

This course (and specifically these paper assignments) develop the following CS-major ABET learning outcomes:
- **Technology:** Each topic will enable students to consider computer architecture as a system, including the interrelationship between multiple hardware components.
- **Continuing Professional Development:** Students will evaluate professional papers as part of this assignment. This will entail observing how the scientific method is used.
- **Social Impact:** Students will also investigate the social and environmental implications of security or energy efficiency. This has implications on a local and global scale.

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 department will be notified. Cheating on assignments is defined to be copying from someone else. For papers, plagiarism is defined as the copying of text, without specifying references and without putting quoted material in quotation marks. (This applies to figures as well.)

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.

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.

Food in Class: Drinks with covers 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.

Weapons: Weapons are prohibited in UW-Parkside buildings and all outdoor events. Anyone found in violation will be subject to immediate removal in addition to academic and/or legal sanctions.