CSCI 222: Computer Organization Fall 2014

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Office Hours:
MWF Noon – 2:00pm
T Noon – 1:00pm

1. Course Description:

A study of what happens when a computer program is executed. We examine the organization of a modern computer from the perspective of a programmer; our examination focuses on the layers of abstraction between a high-level language program and its execution. Topics include the set of instructions that a processor supports, how a high-level language program is translated into this instruction set, how a processor carries out instructions, concurrency, the memory hierarchy, and storage systems.

Prerequisite: *CSCI 121.*

2. Course Objectives

-- Understand how computer systems represent data and programs.
-- Provide a brief introduction to digital logic, upon which all electronic circuits are based.
-- Translate small algorithms and programs into Intel and MIPS assembly language.
-- Simulate the execution of MIPS assembly language programs using the SPIM software environment.
-- Understand how the processor architecture, the memory hierarchy, and processor instruction set affect program performance.

3. Textbook: *Computer Organization and Design (5th ed)*, Patterson and Hennessy.

4. Grading

There are five components of your grade:

-- *Mid-term Exams*: There will be two exams during the semester. Weight: 20%
-- *Final Exam*: A final exam will be given during the College-scheduled exam time. Weight: 15%
-- *Lab assignments*: These will be performed during the lab periods. The lab assignments will involve the use of a variety of course-specific software, such as SPIM and Multimedia Logic. Most labs will be performed individually, but some may allow you to work in teams of size 2. Weight: 30%
-- *Projects*: These will be distributed throughout the semester and are to be performed individually. Weight: 25%
-- *Participation*: This involves attending and actively participating in classroom activities. Weight: 10%

5. Course Policy

5.1 Late Work

I will accept work beyond its due date within reason and with *prior notification* and *discussion*. Late work may be penalized depending on the justification for its tardiness.

5.2 Attendance

Attendance is not mandatory, but it may affect the participation component of your grade. Also, it will be extremely detrimental to your learning to miss class, and you will not benefit from the support of the instructor or TAs if you miss the scheduled lab.

If you are going to miss an exam due to a conflict, you must let me know in advance and arrange for an alternative exam time. If you miss an exam due to illness or some other circumstance, you must let me know as soon as possible and provide appropriate documentation.

5.3 Academic Honesty

Please read the College's Academic Honesty Policy (which you can find in the Student Handbook).

Since collaboration with your colleagues will be an important part of your careers, collaboration is permitted on all graded assignments (*with the exception of exams*). However, you have to turn in your own copy of each assignment *in your own words*. Note that "in your own words" is not meant superficially--collaboration is not copying (digital or otherwise). This applies to programming assignments as well.

For example, if a homework assignment asks you to provide an argument that a given statement is correct, *collaboration* means discussing the high level ideas of an argument with a colleague. *Copying* is transcribing a colleague's argument (and perhaps changing variable names/words).

5.4 Academic Accommodations

Students who would like to request accommodations in this class for a disability should contact Ms. Elaine Mara, Assistant Director of Academic & Disability Support, located on the lower level of Monocacy Hall (extension 1401). Accommodations cannot be provided until authorization is received from the office of Academic & Disability Support.

6. Schedule:

Week	Topic	Reading
1	Computer Abstractions and Technology. Performance.	Ch. 1
2	Intel Architecture. 8086 Instruction Set.	---
3	Logic Design, Gates, and Combinational Logic.	App. C
4	Logic Design Software.	---
5	Instructions: Language of the Computer.	Ch. 2
6	MIPS Instruction Set.	Ch. 2
7	Assemblers, Linkers, and the SPIM Simulator.	App. B
8	Integer Arithmetic for Computers.	Ch. 3
9	Floating-point Arithmetic.	Ch. 3
10	The Processor: Datapath and Control.	Ch. 4
11	Enhancing Performance With Pipelining.	Ch. 4
12	Large and Fast: Exploiting Memory Hierarchy.	Ch. 5
13	Cache Architectures. Virtual Memory.	Ch. 5
14	Storage Technologies.	---
15	File Systems. I/O Systems.	---
16	Final Exam	---

This syllabus is subject to change.