Department of Computing Science, Mathematics and Statistics
Computer Organization and Architecture I
Fall 2002-2003,

Instructor: Dr. Angel Nikolov
Office: C402.
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Office hours: 10am –4pm if not in class

Description

A course is dealing with the fundamentals of computer architecture. A methodical discussion of number systems and arithmetic and basic computer organization including: assembly language programming, addressing, operations, subroutines, and parameter input/output, and an analysis of specific architectures.

Prerequisite: CS1150

Textbooks

1.David A. Patterson and John Hennessy, Computer Organization and Design, Second Edition. Morgan Kaufmann (recommended)

2.William Jones, Assembly Language for the IBM PC family, Second Edition, Pearson Publishers (required)

Course Outline

This outline is subject to change.

1. Introduction (Chapter 1)
   - Program translation (1.2, A.1)
   - Microprocessor (1.3)
2.
3. Number Systems and Binary Arithmetics (Chapter 4)
   - Decimal, binary, hexadecimal, numbers (4.2)
   - Signed numbers (4.2)
   - Binary addition and subtraction (4.3)
   - Logical operations (4.4)
4. The Processor and Datapth (Chapter 5) *
   - Registers, ALU, and multiplexer (5.1); PC and memory (5.2); simple datapath (5.3); and control unit(5.3)
5. Assembly Language
   - Assembly instructions
   - Addressing modes
   - Encoding assembly instructions
   - Branching
   - Procedures/subroutines
   - Compiling, assembling, linking, and loading
   - Applications: procedures and arrays/pointers
6. Exceptions and Interrupts (Chapter 5)
   - Exceptions (5.6)
   - Exception handling (A.7)
   - Interrupts and Interrupt handling(A.7)
7. Input/Output Programming (Chapter 8)
   - Introduction (8.1, 8.2, 8.3)
   - I/O interfacing (8.5)
   - I/O on MIPS (A.8)
   - Polled and interrupt-driven I/O (A.7)
8. Memory Hierarchy (Chapter 7)
   - Locality, memory hierarchy, and cache (7.1)
   - Direct mapped cache (7.2)
   - Set associative cache (7.3)
9. Floating Point Numbers
   - Floating point (4.8)

Marking Scheme

Lab assignments:	35%,
Quizzes:	10%
Midterm:	25%
Final exam:	30% (three hours.)

Penalties for late assignments:
24 hrs delay:10%
one week delay:20%
More than one week delay: 40%

All assignments must be done!

You mush achieve at least a 50% average on the exams in order to have a passing mark.