UCF
School of Computer Science
CDA 4150   Computer Architecture
Spring 2006

Syllabus

Professor : Euripides Montagne   Tele.: 823-2684   email:eurip@cs.ucf.edu
Lecture meetings:
MW 12:00 p.m. – 1:15 p.m. (ENG 224)
Office hours: MW from 10:30 a.m. to 11:30 a.m (CSB 239)
             Tuesday from 12:00 p.m. to 2:00 p.m (CSB 239)
             Thursday from 12:00 p.m. to 1:00 p.m (CSB 239)

TA :   Hongliang Gao   Tele.: 823-3228   email: hgao@cs.ucf.edu
Office hours: Monday, 2:30 p.m. - 4:30 p.m. (CSB 107)
Website: http://www.cs.ucf.edu/courses/cda4150/spring06/

Course Outline: This course is intended to provide students an understanding in the fundamental concepts and design principles of computer architecture. The students will gain a sufficient understanding of the relationships between higher-level programming languages and machine language.

Course Topics: Organization and architecture of computer systems hardware; register transfer notation; Instruction set architecture (ISA); addressing modes; computer arithmetic; processor design for sequential execution, pipelining and superscalars; memory systems; virtual memory; I/O system; interrupt handling; introduction to multiprocessors.

Prerequisites:
- CDA 3103 – Computer Organization

Required textbook:
The textbook for this course is: J. Hennesy and D. Patterson, Computer Architecture: A Quantitative Approach", Morgan Kaufman, 3rd edition, 2002.

Style of Class Meetings:
Class meetings will not consist of traditional lectures, with the instructor doing most of the talking and the student doing most of the listening. Rather, meetings will consist of discussions on each topic and the instructor will help guide the discussion by asking questions.

Grading Policy:
- (20%) **First Midterm exam** – closed book, closed notes exam given in class.
- (20%) **Second Midterm exam** – closed book, closed notes exam given in class.
- (25%) **Final Exam** – closed book, closed notes comprehensive exam given during final exam week.
- (20%) Design Assignments in Verilog (Teams of two)
- (15%) Final project using Verilog (Teams of two)

Letter grades:

90-100	A	(4.00)
88-89	A-	(3.75)
85-87	B+	(3.25)
80-84	B	(3.00)
78-79	B–	(2.75)
75-77	C+	(2.25)
70-74	C	(2.00)
68-69	C–	(1.75)
65-67	D+	(1.25)
60-64	D	(1.00)
58-59	D–	(0.75)
0-57	F	(0.00)

Note: Any academic dishonesty (including, but not limited to, Cheating, copying and/or plagiarism) with respect to any exam or assignment in this class will result in a grade of **F**, following by the usual procedures for dealing with such behavior, as describe in the *UCF Golden Rule : a handbook for students.*

The Semester Plan: Tentative.
Week 1- Logistics, team organization. Introduction to computer architecture.
　　　- Flynn's Taxonomy
Week 2 – SISD architecture, register transfer notation.
　　　– Cost of a Die, Performance, Amdahl's Law
Week 3 – ISA, instruction encodings , addressing modes. Interrupt handling(Case Studies: IBM 360, B5000, MIPS)
　　　- Computer Arithmetic, Floating point arithmetic, Pipelining in the ALU.
Week 4 - Vector processing, Memory Interleaving(Cray-1).
　　　- Chaining, loop unrolling, skewed matrix representation.
Week 5 – Review
　　　– **First Midterm Exam**.
Week 6 – The Processor Data Path and Control Unit.
　　　- Pipeleined Execution. Pipeline data path.
Week 7 - Pipeline Data Hazards.
　　　- Control Hazards. Exception Handling.

Week 8 - ILP:Superscalars. Scoreboarding(CDC6600), Tomasulo's Algorithm.
      - MIPS and IA-64 Architectures.
Week 9 – Systolic Arrays and Data Flow Architectures.
Week 10 - Review
      - **Second Midterm Exam**.
Week 11 - Cache Memory
      - Virtual Memory
Week 12 - I/O Devices and Performance Measures.
      - RAID
Week 13 – Detecting Parallelism in Programs.
 - Multiprocessors.
Week 14 – Interconnection Networks
      -Review
Final Exam April 26th, 2006

Important Dates:

    Last Day to Withdraw: Friday March 3rd

    First Midterm Exam: Wednesday February 22nd

    Second Midterm Exam: Wednesday April 5th

    Final Exam: Wednesday April 26th (10 a. m. to 12:50 a. m.)

    Holidays: Monday January 19th,
                  Monday March 13th to Saturday March 18th (Spring Break|)