

EE 3310 Microprocessors

Summer 2003, F 8:00-11:50am, 108 NH

Instructor:

Jason Losh, Ph.D.

jlosh@uta.edu

Office Hours are after class in 108NH or on Mondays at 5pm in 148 NH.

Textbook:

The 8088 and 8086 Microprocessors – Programming, Interfacing, Software, Hardware, and Applications, 4th ed. by Triebel and Singh.

Catalog Description:

Principles of operation for 80x86 family of microprocessors, including assembly language programming, internal architecture of 80x86 processors, timing analysis, and interfacing techniques. Special emphasis will be placed on hardware-software interactions, design of memory systems for microprocessors and utilization of programmable peripheral devices. Prerequisites: EE 3341, CSE 1320.

Course Topics:

- Review of combinational logic: decoders, multiplexers, and adders
- Review of sequential logic: flip-flops, latches, counters, shift registers, multipliers
- Introduction of basic computer concepts: buses, control and data planes, and memory and i/o spaces
- Stored-program computer concepts: ALU, accumulator, instruction register, program counters, memory
- Development of a simplified single-bus microprocessor
- Comparison of simplified single-bus microprocessor with other 8- and 16-bit processors such as the 80x86/808x/Z80, 680x0/6800/HC11, M80, PIC, and others
- Architecture issues: pipelining, parallel processing, superscalar, CISC v. RISC, microcontrollers v. microprocessors
- 80x86 assembly language programming and high-level language function calls
- 80x86 architecture, interfacing, timing, and memory
- 80x86 i/o devices: parallel and serial/UART (as time permits)

Additional References:

- *Digital Logic Design Principles* by Balabanian and Carlson, 2001, ISBN 0-471-29351-2
- *An Engineering Approach to Digital Design* by Fletcher, 1980, ISBN 0-13-277699-5
- *Embedded Microcontrollers and Processors*, vols. 1 and 2, Intel, 1992, ISBN 1-55512-140-3
- *Microprocessor, Microcontroller and Peripheral Data*, vols. 1 and 2, Motorola, 1998
- *Microprocessors* vols. 1 and 2, Intel, 1992, ISBN 1-55512-150-0
- *Microprocessors and Interfacing – Programming and Hardware*, 2nd ed. by Hall, 1992, ISBN 0-07-025742-6
- *PIC Microcontrollers*, Microchip, 1995
- *Z8 Family Design Handbook*, Zilog, 1988
- *Microprocessor Systems: The 8086/8088 Family*, 2nd ed. by Liu and Gibson, 1986, ISBN 0-13-580499-X
- *Microcomputers and Microprocessors: The 8080, 8085, and Z-80 Programming, Interfacing, and Troubleshooting* by Uffenbeck, 1985, ISBN 0-13-580309-8
- *Programming the 8086/8088* by Coffron, 1983, ISBN 0-89588-120-9
- *The Programmer's PC Sourcebook* by Hogan, 1988, ISBN 1-55615-118-7

Important Dates:

First Day of Classes (Tuesday, 5/27), Census Date (Monday, 6/2), Test 1 (Friday, 6/20), End of First Drop Period (Tuesday, 6/24), Project Hardware Due Date (Monday, 6/30), Fourth of July Holiday (Friday, 7/4), Test 2 (Friday, 7/25), Last UG Drop Date (Tuesday, 7/23), Last EE3310 Class (Monday, 8/5), Official Last Day of Classes (Thursday, 8/7), EE3310 Last Class (Friday, 8/8), Project Defense Date (Friday, 8/8), Test 3 (Wednesday, 8/13 at 8am, and Grades Due (Friday, 8/15).

Tentative Class Schedule:

Building the Microprocessor (12 hours: 5/30, 6/6, 6/13)

Test 1 (1.5 hours: 6/20)

Software Design (12.5 hours: 6/20, 6/27, 7/11, 7/18)

Test 2 (1.5 hours: 7/25)

Hardware Design (12.5 hours: 7/18, 7/25, 8/1, 8/8)

Test 3 (1.5 hours: 8/13)

Performance Assessment:

- Grade scale: A (90-100), B (75-89), C (60-74), D (50-59), and F (0-49)
- Grade calculation: (Test1 + Test2 + Test3 + Project) / 4
- The instructor reserves the right to make reasonable changes in performance evaluation as needed.

Grader

Rayner Barboza, raynerbarboza@hotmail.com, tentative hours: M,W 5:00-6:30pm and T 8-11am in 148NH.

Tests (75% of Grade):

- Test topics:
 - Test 1 will cover the simplified single-bus microprocessor.
 - Test 2 will cover software programming specific to the 80x86 processor.
 - Test 3 will cover hardware design specific to the 8086 maximum-mode processor
- Calculators, rulers, pencils, pens, books, and notes will be allowed during tests.
- Any device capable of compiling or emulating any 80x86 code is not allowed during in-class portions of the tests.
- No makeup will be provided for any test.
- Any request for regarding must be submitted to the grader within one week of the return date.

Project (25% of Grade):

- Each team must complete construction of the servo hardware for this project no later than 6/30.
 - Penalties of 25% of the total hardware portion of the project grade will be assessed per class day.
- The entire project (hardware and software) will be defended on 8/8. No late projects will be accepted.
- If you wish to work in teams of 2 or 3, then you must sign a College of Engineering Ethics Statement.

Academic Honesty:

It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University. "Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts." (Regents' Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22). ANY CHEATING WILL RESULT IN SEVERE PENALTIES. All work submitted must be original. If derived from another source, a full bibliographical citation must be given.

Americans with Disabilities Act:

If you require an accommodation based on disability, please feel free to meet with me during the first week of the semester to make sure that you are properly accommodated. Contact Dr. Cheryl Cardell (272-3670) or Mr. Jim Hayes (272-3364) for more information.