

# EE 6313 Advanced Microprocessor Systems

## Spring 2008

### Instructor:

Jason Losh, Ph.D.

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Office Hours will begin at 6:50pm MW outside the classroom for EE4328.

E-mail is the quickest method of contacting me on non-class days.

### Textbook:

*Computer Organization and Architecture: Designing for Performance*, 7<sup>th</sup> ed., William Stallings, Prentice Hall 2006, ISBN 0-13-185644-8.

Extensive references, datasheets, application notes, and class notes will be provided on the course web site at <http://omega.uta.edu/~jlosh/>.

### Listserv:

Please sign up for the EE6313-L listserv to receive the latest updates (go to <http://listserv.uta.edu> for details)

### Catalog Course Description:

**6313. ADVANCED MICROPROCESSOR SYSTEMS (3-0).** Study of the advanced microprocessor architectures including 32/64-bit RISC processors from leading manufacturers. The design concepts, performance and architectural limitations of RISC and CISC families of microprocessors will be compared based on detailed architectural analysis of the selected devices. Topics include: address/instruction pipelines, burst cycles, memory caching and cache coherency issues, register renaming, speculative instruction execution and other performance-oriented techniques. Prerequisite: EE 5313 or consent of instructor.

### Course Topics:

- CPU Design: ALU, Registers, Control Unit
- Instruction Sets: Minimalism, Orthogonality, RISC/CISC
- Predication, Speculative Execution, and Out of Order Execution
- Protected Mode Operation
- Multitasking Operating Systems
- Pipelining: Design, Hazards, Stall/Forwarding Resolution
- Parallelism and Superscalar Architectures
- Cache Memory Design: Mapping, Miss/Hit, Replacement, Write-back Strategies
- Virtual Memory: Paging, Segmentation, Translation and Look-around
- High-speed I/O Design

### Important Dates:

First Class (Monday, 1/14), No Class (Monday, 1/21), Census Date (Wednesday, 1/30), Spring Break (Monday-Friday, 3/17-21), Last Undergraduate Drop Date (Friday, 3/28), and Last Graduate Drop Date (Friday, 4/11)

### Performance Assessment:

- Grade scale: A (90-100), B (75-89), C (60-74), D (50-59), and F (0-49)
- Standard grade calculation: (Project 1 + Project) / 2
- The instructor reserves the right to make reasonable changes in performance evaluation as needed.

### Graduate Teaching Assistant:

TBD

**Projects:**

- Project teams will consist of one or two team members
- 2 projects will be assigned.

**Academic Integrity:**

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, Series 50101, Section 2.2)

EE Department Policy requires that you sign and return a letter acknowledging the College of Engineering Ethics policy.

**Americans with Disabilities Act:**

The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 92-112 - The Rehabilitation Act of 1973 as amended. With the passage of federal legislation entitled Americans with Disabilities Act (ADA), pursuant to section 504 of the Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with informing faculty of their need for accommodation and in providing authorized documentation through designated administrative channels. Information regarding specific diagnostic criteria and policies for obtaining academic accommodations can be found at [www.uta.edu/disability](http://www.uta.edu/disability). Also, you may visit the Office for Students with Disabilities in room 102 of University Hall or call them at (817) 272-3364.

**Student Support Services:**

The University of Texas at Arlington supports a variety of student success programs to help you connect with the University and achieve academic success. These programs include learning assistance, developmental education, advising and mentoring, admission and transition, and federally funded programs. Students requiring assistance academically, personally, or socially should contact the Office of Student Success Programs at 817-272-6107 for more information and appropriate referrals.