Spring 2013

Part A - Course Outline

Catalog description:
(3-0) 3 hours credit.
Description of digital computer systems, arithmetic algorithms, central processor design, memory hierarchies and virtual memory, control unit and microprogramming, input and output, coprocessors, and multiprocessing.

Prerequisites:
Graduate standing or consent of instructor.

Textbook(s) and/or required materials:
No required textbook, but the class will use multiple reference books

Reference books:
Computer Architecture – A Quantitative Approach,
(Authors: J. Hennessy and D. Patterson), Morgan Kaufmann
Computer Organization and Design – The hardware / software interface,
(Authors: D. Patterson and J. Hennessy), Morgan Kaufmann
Modern Processor Design Fundamentals of Superscalar Processors
(Author: John Shen), McGraw-Hill
Introduction to Computing Systems – from bits & gates to C & beyond,
(Authors: Y. Patt and S. Patel), McGraw-Hill

Major prerequisites by topic:
1. Basic logic design
2. State machine
3. Processor pipeline
4. Cache memory and virtual memory
5. Instruction set architecture
6. C/C++ programming

Course objectives:
1. To develop skills in computer architecture
2. To understand memory hierarchy, parallel processing, arithmetic, microprogramming
3. To understand fundamentals of microprocessors design.

Topics covered:
- Review of basic digital systems design
- Fundamentals of computer design (pipelining, instruction set principles)
- Instruction-level parallelism and its exploitation
- Limits on instruction-level parallelism
• Multiprocessor and thread-level parallelism
• Memory hierarchy design
• Storage system
• Recent research topics

Course content:
• 60% Engineering Sciences; 40% Engineering Design

Class schedule:
• 2 – 75 minute lecture session/week

Contribution of course to meet the professional component:
• This course prepares students to work professionally in the area of microprocessor design.

Part B - Course Details

Instructor:
• Name: Dr. Byeong Kil Lee
• Office: BSE 1.528
• Office hours: M/W 2-3pm or by appointment
• E-mail: byeong.lee@utsa.edu
• URL: http://www.ece.utsa.edu/~blee

Class:
• Classroom: EB 2.04.02
• Class hours: M/W 5:30 – 6:45 pm

TA/Grader: TBD
• Name:
• E-mail:
• TA hours:

Evaluation methods:
• Homework & Lab assignments 25%
• Midterm Exam 20%
• Final Exam 30%
• Term Project (literature survey, progress reports, final report, presentations) 20%
• Class Participation, Pop quizzes, etc. 5%

Homework and Lab Assignment:
• 4 & 4
• Lab assignments include C/C++ programming, simulation and analysis, etc.

Attendance Policy:
• Attendance is required. Students are responsible for topics covered in missed classes, as well as any assignments due.

Academic Integrity and Collaboration:
• Cheating in any form will be fully prosecuted.
Pop quizzes:
- There will be quizzes during the semester. No makeups allowed on pop quizzes, but extra credit from labs can compensate for credit lost in quizzes.

In classroom:
- No disruptive activity/talking amongst students in class during lectures. If you have a question on the material, ask the instructor. Be professional in your behavior in class. Disruptive activity can lead to grade penalties.
- The University of Texas at San Antonio provides, upon request, appropriate academic adjustments for qualified students with disabilities. For more information, visit Disability services homepage (http://www.utsa.edu/disability/) or call to (210) 458-4157

Links:

Coordinator:
- Byeong K. Lee, Assistant Professor, Electrical and Computer Engineering