Course: ECE 56500 - Computer Architecture

Type of Course: Elective for the CmpE and EE programs
As of 2010 this course will no longer be offered

Catalog Description: An introduction to the problems involved in designing and analyzing current machine architectures. Major topics include performance and cost analysis, pipeline processing, vector machines and numerical applications, hierarchical memory design, and multiprocessor architectures. A quantitative approach allowing a computer system designer to determine the extent to which a design meets design goals is emphasized.

Credits: 3, Dual Level, Undergraduate-Graduate

Contact Hours: 3

Prerequisite Courses: ECE 43700 or graduate standing.

Prerequisites by Topics: Computer organization such as processor datapath, processor control, pipeline structure, memory hierarchy and virtual memory, and I/O


Course Objectives: This course qualitatively and quantitatively examines uniprocessor computer design trade-offs. We will learn, for example, how uniprocessors execute many instructions concurrently and why state-of-the-art memory systems are nearly as complex as processors.

Course Outcomes: Students who successfully complete this course will have demonstrated:
• an understanding of instruction-level parallelism. [a, e]
• an understanding of multiprocessors and thread-level parallelism. [a, e]
• an understanding of memory hierarchy design. [a, e]
• an understanding of storage systems. [a, e]

Lecture Topics:
1. Introduction
2. Performance and Cost
3. Pipelining - implementation and evaluation
4. Advanced pipelining - hardware and compiler techniques
5. Memory Hierarchy - cache design and evaluation
6. Advanced cache and compiler techniques, and virtual memory
7. Input/Output - devices and performance
8. Multiprocessors

Computer Usage

Laboratory Experience

Design Experience

Coordinator

Date 23/3/11