Course number and name ECE 353, Computer Architecture

Credits, contact hours 3 credits, 3 contact hours

Name(s) of instructor(s) or course coordinator(s) John Carpinelli

Instructional Materials *Computer Systems Organization and Architecture* (recommended)

Specific course information

brief description of the content of the course (catalog description)

Emphasizes the hardware design of computer systems. Topics include register transfer logic, central processing unit design, microprogramming, ALU design, pipelining, vector processing, micro-coded arithmetic algorithms, I/O organization, memory organization and multiprocessing.

Prerequisite ECE 252, Microprocessors

Educational objectives for the course (e.g. The student will be able to explain the significance of current research about a particular topic.)

1. The student will be able to design the instruction set architecture for a processor to meet specific computer requirements.
2. The student will be able to evaluate the tradeoffs in the design of an instruction set architecture and the processor that implements it.
3. The student will be able to design a system to meet a given specification using register transfer language.
4. The student will be able to design a basic CPU given the instruction set architecture using either hardwired or microcoded control.
5. The students will be able to design a hierarchical memory system to meet a given specification.
6. The student will be able to design an I/O system to meet a given specification.

Brief list of topics to be covered

- Instruction Set Architectures
- Basic Computer Organization
- Register Transfer Languages
- CPU Design - Hardwired Control
- Microsequencer Control Unit Design
- Computer Arithmetic
- Memory Organization
- I/O Organization
- RISC Processing
- Parallel Processing