Call Number 1843 (Fall 2003)

URL: http://www.ece.lsu.edu/tca

Offered by: David M. Koppelman 349 EE Building 578-5482, koppel@ece.lsu.edu, http://www.ece.lsu.edu/koppel Tentative office hours: Monday & Wednesday: 14:00-15:00, Tuesday & Thursday 9:00-10:30.

Should already know:

How to design a computer.

How to design a good computer.

Will learn:

How to design a *better* computer.

Prerequisites By Course:

EE 4720, Computer Architecture (Credit or Registration?)

Prerequisites By Topic:

- Logic design.
- Computer organization.
- Assembly-language programming.
- Computer architecture.
- C programming.

Text

"Computer architecture, a quantitative approach," John L. Hennessy & David A. Patterson, Third Edition. (Recommended but not required, one or two chapters used.)

Technical papers. (Many will be linked to Web site.)

Course Content

- Limits of computer performance.
- Simulation and instrumentation techniques.
- Instruction fetch (front-end) techniques.
- Out-of-order fetch techniques.
- Branch and data prediction.
- Critical-path-friendly implementation techniques.
- Prefetch and advanced caching techniques.
- Symmetric multiprocessing (shared memory computers).
- Simultaneous Multithreading.
- Non-standard control-flow machines.
- And more! (Time permitting.)

Midterm Exam, 35%

Fifty minutes, closed book, open notes and papers.

Final Exam, 35%

Two hours, closed book, open notes and papers.

Homework and Computer Projects, 30%

Lowest grade or unsubmitted assignment dropped.

Computer Projects

Analyze or simulate some architectural feature.

Use real research tools.

Examples:

Test new branch prediction technique.

See how useful a new instruction would be.

But won't that be hard?

Not that hard.

Programs for similar problems will be provided.