Call Number 1843 (Fall 2003)

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

Offered by:
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  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.)

Graded Material
  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.