EE 7700-1, Computer Architecture Research Methods: Simulation, Visualization, Presentation  
(Listed as: Advanced Computer Implementation)

Where/When/How/URL  
3140 CEBA Building, Monday Wednesday Friday 12:40–13:30, Spring 2006  
Call Number 1905, [http://www.ece.lsu.edu/tca/](http://www.ece.lsu.edu/tca/)

Who  
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Office Hours: Monday–Friday: 9:00–10:00.

Prerequisites  
By Topic: Assembly-language programming, C programming, computer organization, and digital logic.

Description  
The course will cover the tools and techniques used to develop and evaluate new microarchitectural innovations. Students, in teams, will use a research simulator and visualization tool on their own innovations and throughout the semester will present results and submit parts of a manuscript. By the end of the semester each team will have a complete manuscript reporting their work.

Topics  
- Overview of Computer Architecture Research Methods  
- Simulator Types  
  - Very fast to very realistic.  
- Benchmarks, Input Sets, and Sampling  
  - Trying to simulate what your customers run.  
- Experimental Goals  
  - How close to perfect? How broadly useful?  
- Visualization  
  - Visually find problems and evaluate your solutions.  
- Manuscript Structure  
  - How to show the value of your idea in 10 pages.  
- Use of Research Literature  
  - Quickly find out what’s been done.  
- Selected Computer Architecture Areas  
  - Branch Prediction, Caches, Hardware Prefetch, and other topics.  

Topics not covered in the order shown above and are subject to change.

Text  
Papers and other references (no textbook).

Grading  
20% Homework Assignments • 25% Presentations • 30% Term Paper (completed in parts throughout the semester) • 25% Final Exam  
Final exam weight may be increased for a student who shows significant improvement on the final exam.  
Late assignment penalty: 10% per day late deducted. Daily attendance: optional, however students are responsible for all material, instructions, and notices presented in class.