CS 8803 MCA – Manycore Computer Architecture
Syllabus - Spring 2009

Prof. Tom Conte conte@gatech.edu, 5-7657

Office Hours [*held in 2334 KACB*]: **2:00 PM-3:00 PM Mondays, Noon-class time Wed'days**

Description: 3 Credit Hrs.
Coverage of multi-core and manycore architectures and systems. Topics include architectural simulation and programming of manycores, technology constraints, emerging technology potential solutions.

Website: **`http://t-square.gatech.edu/`** --Check the website often (at least once per week). All assignments course notes will be passed out via the website only.

Preq: **(1)** CS 6290 ***or*** competence general-purpose computer architecture
(2) competence with programming data structures,
(3) Programming ability in C, C++ or Java (I will 'support' C/C++)

Book: **(1)** ***No BOOK*** - Course notes only

Goals: This course is designed to give the senior student/introductory graduate student an in-depth understanding of the architecture, simulation and programming of manycore systems. This goal is achieved by detailed studies of real manycores, and via quantitative tradeoff analysis through programming and experimentation.

Remarks: Because of the "Power Wall," computing must encompass multiple processors on a single die. But there are two philosophies for this: one ("multi-core") is to put as large cores as the technology will permit. The second ("manycore") is to simplify the cores and emphasize placing as many cores on-die as is practical.

Topics:

1. Introduction and Overview: Why manycore, how multi-core and manycore differ (3-4 lectures)
2. Overview of VLSI issues related to manycore (1-2 lectures)
3. Existing manycore architectures (3-4 lectures)
4. Manycore memory system issues (4-5 lectures)
5. Manycore interconnects (4-5 lectures)
6. Manycore programming languages (5-6 lectures)
7. Simulation environments for manycore (5-6 lecture)
8. Active research in manycores (5-6 lectures)
9. Midterm exam (1 lecture)
10. Project presentations (5-6 lectures)

Course Workload:
The course has three programming/simulation projects.

40%	Projects I, II, and III
25%	Midterm exam **(Thursday, March 2nd in class)**
25%	Final exam (prescheduled for **Thursday, May 4th, 1:00-4:00 PM, in classroom)**
10%	Homeworks* (approximately 4)

Projects: There are three semester projects that involve either programming or simulating a manycore system. More details of the projects will be announced when Project I is assigned.

***Homework #0:** You are required to visit my office at least once during my office hours and before the midterm exam (Mar. 2nd). You must announce that your visit is "for homework 0." This counts as a real homework! *If for some reason you cannot meet this requirement, please contact me via email.*

Statement on Honor Code: Students are expected to have read and agreed to the Georgia Tech Honor Code, see http://www.deanofstudents.gatech.edu/Honor

Statement on late assignments: No work will be accepted late for credit. All assignments must be turned in at the beginning of class on the date they are due. There is no additional "extra credit" available to any students. Students who believe they have valid excuses to miss exams must comply with University Attendance Regulations, see http://www.ncsu.edu/provost/academic_policies/attend/reg.htm

Statement for students with disabilities: Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with the ADAPTS Office, located in the Office of the Dean of Students (ODOS) see http://www.deanofstudents.gatech.edu/support_services/students_disabilities.html

Statement for not mentioned policies and issues: Any policies and issues not mentioned in this syllabus will follow policies and procedures according to the Georgia Tech Office of the Dean of Students, see http://www.deanofstudents.gatech.edu/Policy/

Electronic recording of lectures is not permitted except for those with documented disabilities. I must be notified of any recording in such cases.