GEORGIA INSTITUTE OF TECHNOLOGY

College of Computing

CS6290/CS4290 — High-Performance Computer Architecture

Fall 2001

CS6290/CS4290 Handout #1 — Issued: August 20, 2001
Introduction and Syllabus

Instructor:	Prof. Ken Mackenzie `kenmac@cc.gatech.edu` Office: CoC 219, x4-1704 WTh4-5. Assistant: Yolanda Harris, CoC 264, x5-1353
Web:	`http://www.cc.gatech.edu/classes/AY2002/cs6290_fall/`
Lecture:	MWF3-4 in TBA (Fridays are generally discussion)
Text:	Hennessy and Patterson, Computer Architecture: A Quantitative Approach, Morgan Kaufman, 1995 (Second Edition), along with papers to be distributed in class to fuel discussions.
Description:	This course serves as graduate-level (or advanced undergraduate) introduction to computer architecture. In this course, you will learn about the design and evaluation of computers, particularly advanced (internally parallel) uniprocessors and memory systems.
Topics:	Memory systems: caching, naming, protection Implicitly-parallel architectures: VLIW, superscalar, dataflow Out-of-order and speculative execution mechanisms Interconnects for parallel processing and for I/O Overview of explicitly parallel architectures and emerging hybrids
Prerequisites:	You should be familiar with computer organization at the level of CS2200. Students cannot receive credit for both CS4290 and CS6290 because the material is the same. Also, ECE6100 is substantially the same course.
Assignments:	8 short homeworks + 2 design projects 1 in-class midterm 1 final project with presentation
Grading:	20% Homeworks (divided evenly, lowest one dropped) 30% Projects (15/15%) 20% Midterm Exam 30% Final project and presentation *CS6290 and CS4290 will be graded independently.*

Tentative Calendar

(Aug)	**20**	*first class*		**22**		**24**	Homework 0 due
	27			**29**		**31**	Homework 1 due
(Sep)	**3**	*holiday*		**5**		**7**	Homework 2 due
	10			**12**		**14**	
	17			**19**		**21**	Project 1 due
	24	*midterm*		**26**		**28**	
(Oct)	**1**			**2**		**5**	Homework 3 due
	8			**10**		**12**	Homework 4 due
	15	*holiday*		**17**		**19**	Homework 5 due
	22			**24**		**26**	
	29			**31**		**2**	Project 2 due
(Nov)	**5**			**7**		**9**	Homework 6 due
	12			**14**		**16**	Homework 7 due
	19			**21**		**23**	*holiday*
	26			**28**		**30**	Homework 8 due
(Dec)	**3**	*presentations*		**5**	*presentations*	**7**	*presentations*

Homework and Projects: Homework consists of relatively short problem sets plus two design projects. The projects consist of paper system designs which are carefully justified using simulation measurements of benchmarks. The simulators and benchmarks are Solaris/SPARC-based and written in C.

Late Policy: Homeworks are due at the beginning of the class indicated. Late homework will not be accepted.

Final Project: The usual form of a project is to explore an architecture research topic in groups of 2 or 3. For instance, you might extend a result reported in one of the papers we read or re-validate a known result by writing a simulator. The homeworks will introduce various tools and techniques that may be useful. Alternatively, a group of 2 can undertake to report in depth on an aspect of architecture that the course must skip over. All projects will include a 10-12 page paper and an oral presentation.

Collaboration: Unless specifically indicated otherwise, collaboration on projects and homework in **pairs** is welcome and encouraged. If you work in a pair, turn in one write-up with the names of both collaborators. You are welcome to discuss high-level concepts with other groups, but all homework/project solutions must be worked out and written up separately.