CSCE 6610 Advanced Computer Architecture
Multicore and Many Core Processors

You May Want To Know

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Tentative Grading Policy

Mid-Semester Exam	15%
Final Exam	15%
Assignments	30%
Project	30%
Discretion	10%

Remarks.

1. *This is an advanced level course and requires each student to read papers on current research, write reports on papers read, as well as actively participate in discussions in class*. The discretion portion of the grade will be based on your participation, initiative and motivation to look for additional material related to the course.
2. While grading examinations, I grade one problem at a time. That is, I read through each student's answer for a problem, give the highest score (need not be the maximum) to the best solution, and assign scores for the rest based on how well their solution compares with the best.
3. For grading purposes, assignments consist of reading papers and writing critiques of the contents.
4. For class project, you may write a simulator with specific architectural features or work with our multithreaded dataflow simulator; You may also consider investigating one or more of multithreaded systems, check into obtaining the software, install on local systems, write simple programs and then write a report describing the strengths and weakness of the systems you have investigated. I am open to other suggestions as well. I am open to other possibilities also. Note that since the project carries 30% of the grade, the project must involve significant effort.
5. The instructor reserves the right to modify course policies, the course contents and the order in which the topics are covered.
6. *All students will be trusted to pursue their academic careers with honesty and integrity. Academic dishonesty includes, but not limited to, cheating on a test or other course work, plagiarism, unauthorized collaboration with other persons. Students found guilty of dishonesty will be subject to penalties that may include suspension from the university.*

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Course Outline

		Hours
1.	Introduction and background Why the trend towards multicore How to measure performance Power management techniques	3
2.	Review of Conventional Architectures. Conventional architectures In-order and Out-of-order Branch Prediction and Speculative Execution Cache memories	3
3.	Multicore and Many Core CPUs Challenges and future Single thread performance Programming Shared LLC Memory models for multithreading	6
4.	Back to Future Core fusion Improving single thread performance	6
5.	Non-Uniform Accesses and NUCA Optimizing cache performance Shared and coherence issues	6
6.	Power Management Techniques Voltage and Frequency Scaling Scheduling and software techniques	6
7.	Scheduling and Load Balancing in Multocre Dynamic and Static techniques Work Stealing	6
7.	Student Presentations	3