

CSc 846 Systems Architecture

Catalog Description: Principles of computer systems architecture with emphasis on hardware/software interactions for large applications and design for performance. Extra fee required.

Prerequisites: grade of B or better in CSc 656 or consent of instructor

Texts: *Programming Massively Parallel Processing: A Hands-on Approach*, by Kirk and Hwu, Morgan Kaufmann
MPI tutorial at <http://webct.ncsa.uiuc.edu:8900/public/MPI/>
CSc 846 lecture slides (available from SFSU bookstore)

References: *Computer Architecture -- a Quantitative Approach* by Hennessy and Patterson, 4th edition (Morgan-Kaufmann)
Parallel Programming with MPI by Peter Pacheco (Morgan Kaufmann)
Modern Processor Desigh by Shen and Lipasti (McGraw Hill)
Parallel computer architecture by David Culler et al. (Morgan Kaufmann)
The Grid 2 by Ian Foster (Morgan Kaufmann)
journals and conference proceedings to be announced in class

Topics: Performance and Cost
General purpose instruction set design
Scalar pipelines with out-of-order issue
Multiple-issue architectures
Multiprocessor systems
GPUs and CUDA
Message-based parallel programming
Shared memory-based parallel programming
Advanced memory hierarchy design

Grading: Prerequisite quiz
Midterm
Final
3-5 projects and presentations
in-class and iLearn forum participation