

**EE 557 Course Outline, Fall 2003**  
**University of Southern California**  
**Computer Systems Architecture**

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**Course Description:**

This course deals with systems architecture of high-performance computers. The course covers instruction sets, advanced processor designs, memory, storage and I/O subsystems, interconnection networks; symmetric multiprocessors (SMP), cache-coherent NUMA machines, and multicomputer clusters. These topics emphasize micro-architectures, advanced pipelining, parallelism, clustering, scalability and availability in building and application of modern computer systems.

**Syllabus: (About 2 weeks per each topic listed below )**

1. Computer models and performance metrics (Chap.1)
2. Instruction set architectures (CISC, RISC, Hybrid, etc, Chap.2)
3. Instruction-Level Parallelism in Processors (Superscalar, VLIW, etc, Chap.3)
4. Memory architecture, I/O and RAID Subsystems (Chap. 5)
5. Shared-memory multiprocessors (SMP and CC-NUMA, Chap. 6)
6. Disk Arrays and Storage Networks (Chapter 7)
7. Multicomputer Clusters and Grids (Chap.8)

**Prerequisite:** EE 457 or equivalent course required or passing the diagnostic test.

**Grading Policy:** 4 HW sets (20 %), 3 quizzes (15 %),  
Midterm Exam (25 %), and Final Exam (40 %)

**Required Textbook:**

John Hennessy and David Patterson,  
*Computer Architecture: A Quantative Approach*, Morgan Kaufmann  
Publishers, Third Edition, (ISBN 1-55860-596-7), published in 2002.