

CS210
Exam 2 Review Guide

Chapter 4 – The Processor

- 4.1 to 4.4 – Single cycle processor
 - General concepts in data and control path:
 - Instruction memory
 - Data memory
 - Program counter
 - Register file
 - ALU
 - Given a data and control path diagram:
 - Show the active elements for one instruction
 - Write opcode for the instruction
 - Questions about performance issues
- 4.5 – Pipelining
 - General concepts
 - Hazards

Chapter 5 – Memory

- 5.1 – 5.4
 - General concepts:
 - Principle of locality:
 - Temporal
 - Spatial
 - Memory hierarchy
 - Technologies
 - Memory Cache
 - Direct mapped cache
 - Basic algorithm
 - Block size
 - Write through
 - Write back
 - Associative Caches
 - Fully associative
 - N-way associative
 - Replacement policy
 - Cache table on a sequence of addresses
 - Multilevel cache

- **5.5-5.7 – Virtual machine & Memory**
 - Virtual machines
 - General concepts
 - Virtual memory
 - General concepts:
 - Virtual address
 - Physical address
 - Address translation
 - Page tables
 - Page tables
 - Replacement & Writes
 - Fast translation with TLB (Translation Look-aside Buffer)
 - Misses
 - Interaction with cache

Chapter 6 – Parallel Processing

- Chapter 6.1 -6.6
 - General concepts
 - Scaling
 - Amdahl's Law
 - Scaling from 10 to 100 -> what is the speedup
 - Strong vs weak scaling
 - Vector processing vs scalar
 - Multithreading
 - Threading vs process
 - Fine-grain, coarse grain, simultaneous multithreading
 - GPU
 - General definitions
 - applications