Fall 2005 Midterm Exam Review

When / Where
Monday, 24 October 2005, 12:40-13:30 CDT
CEBA 2142 (Here)

Conditions
Closed Book, Closed Notes
Bring one sheet of notes (both sides), 216 mm \times 280 mm.
No use of communication devices.

Format
Several problems, short-answer questions.

Resources
Solved tests and homework: http://www.ece.lsu.edu/ee4720/prev.html

Study Recommendations
Study this semester's homework assignments. Similar problems may appear on the exam.

Solve Old Problems—memorizing solutions is not the same as solving.
Following and understanding solutions is not the same as solving.
Use the solutions for brief hints and to check your own solutions.

Previous Midterms

Emphasis
MIPS Programming and Instruction Use
Should be able to easily understand and write MIPS programs.
Should be able to use other instructions in examples.
For example, SPARC, DLX, etc.
Not required to memorize instruction names, except for common MIPS instructions.

Topics
Introductory Material
ISA v. Implementation.
CPU Performance Equation
Benchmark types.
Compiling and Optimization

SPEC Benchmark Suite
SPEC membership and their interests.
Benchmark programs (types, how they were selected).
Rules for running benchmarks and disclosing results.
Compilers and Optimization

Steps in building and compiling.

Basic optimization techniques, compiler optimization switches.

Profiling.

Compiler ISA and implementation switches.

How programmer typically uses compiler switches (options).

Instruction Set Design

Data Types: What to include, what to leave out.

Basic integer and floating point

Packed types: BCD, integer, saturating integer.

Size choices.

Addressing Modes: What they do, which ones to include.

Register, Immediate, Direct, Register Deferred (Register Indirect), Displacement, Indexed, Memory Indirect, Autoincrement, Autodecrement, Scaled.

Synthetic Instructions

Statically Scheduled MIPS Implementations

Unpipelined Implementation

Understand relationship between insn format and connections to register file, etc.