15-745: Optimizing Compilers, Spring 2011
Exam Coverage Information

The exam is closed book, closed notes. Most of the questions on the exam will be short-answer questions.

Regarding the material that will be covered in the exam, the lectures have been broken down into the following three categories:

1. **Lectures that may be covered in depth:**

   - Lecture 2: Local Optimizations
   - Lecture 4: Data Flow Analysis: Examples
   - Lecture 5: Data Flow Analysis: Theory
   - Lecture 6: Common Subexpressions, Constant Folding
   - Lecture 7: Loop Invariant Code Motion
   - Lecture 8: Induction Variables, Strength Reduction
   - Lecture 9: Partial Redundancy Elimination
   - Lecture 11: Region-Based Analysis
   - Lecture 14: Register Allocation: Coloring
   - Lecture 15: Register Allocation: Spilling
   - Lecture 17: List Scheduling, Global Scheduling
   - Lecture 21: Prefetching

2. **Lectures where you may see one or two high-level questions** *(to demonstrate that you understood some of of the key high-level points of the lecture)*:

   - Lecture 10: Lazy Code Motion
   - Lecture 12: Intro to Static Single Assignment (SSA)
   - Lecture 16: Intro to Instruction Scheduling
   - Lecture 18: Software Pipelining
   - Lecture 26: Array Dependence Analysis
   - Lecture 27: Pointer Analysis

3. **Lectures that will not be covered on the exam:**

   - Lecture 1: Overview of Optimizations
   - Lecture 3: The LLVM Compiler

- Lecture 13: SSA-Style Optimizations
- Lecture 19: Memory Hierarchy Optimizations
- Lecture 20: Locality Analysis
- Lecture 22: Recent Research on Optimization I
- Lecture 23: Recent Research on Optimization II
- Lecture 24: Recent Research on Optimization III
- Lecture 25: Dynamic Code Optimization
- Lecture 28: Thread-Level Speculation