1. **Midterm administrative stuff**

The midterm exam is March 13, in class, and will be closed book, closed notes. It will have four questions, three of which will be taken from the list below, verbatim. The fourth will probably be taken from the list below, but I’m leaving myself the option of adding a question if I think of an important topic that I forgot to cover here.

The midterm counts for 30% of your final grade.

You are allowed to collaborate in your preparation for the exam.

2. **Possible questions**

- Give the various types of dependencies that can exist in programs, describe the problems that each causes, and illustrate at least one mechanism for each that addresses the problem.

- Tomasulo states that his algorithm achieves the same performance as loop unrolling without the need for code modification. Describe Tomasulo’s algorithm and explain his statement.

- When would one need a reorder buffer? How does a reorder buffer work and how is it different from a future file and history buffer?

- What are some of the issues in dealing with virtually indexed and virtually tagged caches?

- How do DRAMs work, what are their limitations, and how do the various new DRAM offerings (e.g. fast page mode, extended data out, Enhanced Memory’s SDRAM, Rambus, Direct Rambus, dual data rate DRAMs, Virtual Channel DRAM, etc.) address the limitations?

- What are some of the issues in designing DRAM systems at the organizational level?

- What are some of the differences and similarities between VLIW machines and traditional superscalars?

- What are some of the more important issues (and their solutions, if any) that are facing today’s microarchitects? How do they differ from the issues that faced architects 30 years ago?