

**Date: Saturday, May 8**

**Time: 7:45am-9:45am (120 min) – please be there by 7:40am**

**Location: MCB 307 (usual classroom)**

**Format:** The final exam will consist of 5-8 multipart questions. It will be **closed book, closed notes, closed computer/without wireless access**. However, you are **allowed to bring one letter-sized sheet of paper with prepared notes** (you may use front and back of that sheet.) In addition, you may also bring the sheet you prepared for the midterm exam.

You are responsible for the content of lectures 1 through 26 (up to including the May 5 lecture.) This content includes, among others:

- Machine-level representations of programs: stack discipline, use of machine instructions and registers, etc.; role of the compiler
- Program performance and compiler optimizations; profiling
- Linking and loading: static and dynamic linking, scoping
- Threads & processes: dual-mode operation, context switching, mode switching
- Unix process API, system call use, use of signals
- Unix I/O, Standard I/O
- Multi-threaded Programming: concurrency principles and synchronization, including locks, semaphores, and condition variables; thread-safety; deadlock
- Memory management: dynamic storage management, explicit algorithms and automatic storage management (garbage collection); memory debugging tools, principles and applications of virtual memory
- Network programming: client-server mode, socket interface, HTTP; server models

Our textbook covers this material in Chapters 1, 3, 5-8, and 10-13. The final may also contain questions related to projects 1-5 and exercises 1-10.

Although the final exam is comprehensive, more emphasis will be given to material covered since the midterm exam.