Date: **CRN 97253 (McQuain): Dec 16, 10:05am.**
CRN 97254 (Back): Dec 13, 7:45am.
Please be there 5 mins before the assigned time.

Location: **Classroom for your section**

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 Dec 7 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
- 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;
- 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, 5-12.

The midterm may also contain questions related to projects 1-5 and exercises 1-11.

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