

# CSCI 4320 (Principles of Operating Systems), Fall 2010

## Review for Final Exam

### 1 Format of the exam

The exam will be at the scheduled time for the course final, December 10 at noon. The exam will be about twice the length of the first exam (intended to take 50 minutes), but you can use the full three-hour period if you like. You may use your textbook and any notes or papers you care to bring (with the exception of any materials from this course in previous years). You may not use other books, a calculator or computer (*except* that you may use a browser to view the course Web site, or whatever you need to view an online copy of the course textbook, if that is what you have), or (of course) each other's papers. Many questions are likely to be similar in format to those in the minute essays or homework assignments; there will likely also be some multiple-choice or true/false questions, similar to those on the midterm. You might be asked to write or comment on code/pseudocode, but it's unlikely that you'll be asked to write more than a few lines. Most questions will be more difficult than the minute-essay questions but less difficult (or at least less time-consuming) than the homework problems. There will be some questions on material from the first part of the course (before the midterm), but the emphasis will be on material from the later part of the course.

### 2 Lecture topics to review

You are responsible for all material presented during lecture (including any topics not covered in the textbook), but the following is a list of topics I consider most important from the second half of the course. (See the midterm review sheet for a list of topics from the first half.)

- Address space abstraction; virtual (program) addresses versus physical addresses.
- Schemes for managing memory (monoprogramming, multiprogramming with variable partitions, paging, segmentation (very briefly)); advantages and disadvantages of each; implementation details at the level of the homework problems.
- "Page faults" (what they are, how they're handled).
- Page replacement algorithms (what they're for, which ones work well and why).
- Filesystem abstraction (files, directories, file types, access methods, etc.).
- Basics of filesystem implementation (ways of allocating space for files and their advantages/disadvantages, disk-space management, reliability issues).
- Basics of I/O hardware (devices, device controllers, I/O ports versus memory-mapped I/O, DMA).
- Goals of I/O software.
- Basics of I/O software (programmed I/O versus interrupt-driven I/O versus I/O using DMA).
- I/O software layers and how they work together.

- Basics of I/O software for specific types of devices (disks, character-oriented terminals, GUI and network terminals): what the device sends/expects, what functionality the software typically provides.
- Deadlocks (what they are, strategies for avoiding them).
- Security (goals, a little about ways in which systems can be attacked or compromised).

### **3 Reading to review**

You should have read all of chapters 1, 2, 3, 4, 5, 6, and 9. Probably the best way to approach reviewing the reading is to skim all of it, paying more attention to topics I covered in class, and (re)read the last (summary) section of each chapter.

### **4 Other tips**

You should also be sure to review all homeworks (and sample solutions) and the non-opinion minute essay questions.