CSCI 4320 (Principles of Operating Systems), Fall 2005
Review for Exam 2

1 Format of the exam

The exam will be at the scheduled time for the course final, December 13 at 2pm. 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, or (of course) each other's papers. Most questions are likely to be similar in format to those in the minute essays or homework assignments; there might also be a few multiple-choice or true/false questions. 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 Exam 1), 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.

- Topics from review sheet for Exam 1.

- Deadlocks — what they are, how to prevent them.

- Memory management:

    - 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.

- I/O:

    - Basics about I/O hardware — devices, device controllers, I/O ports versus memory-mapped I/O, DMA.
    - Goals of I/O software.
    - Basics about 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.

- Files and file systems:

  - View from user / application program side — file and directory abstractions.
  - View from implementation side — ways of allocating space for files, disk-space management, reliability issues.

3   Reading to review

You should have read all of chapters 1, 2, 3, 4, 5, and 6. 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.