

CSCI 3323 (Principles of Operating Systems), Fall 2020

Review for Midterm Exam

1 Format of the exam

The exam will be take-home, made available no later than Monday November 2 and due no later than Monday November 9 at 6pm. I will put a PDF in the shared Google Folder for the course. When you're ready to take the exam, download a copy and answer the questions in one of the following ways:

- Print it, fill in answers by hand, scan it, and turn that into a PDF.
- Create a document with just your answers and turn that into a PDF.
- Mark up the downloaded PDF with your choice of tool. Please try to find something that preserves the existing format reasonably well.

E-mail me the resulting PDF.

This is a timed exam. (I'm trusting you to police yourselves on this); it's meant to take about an hour and a half, but you may spend up to three hours on it if you need to. *However*, those three hours must be one continuous block. As is usually true for my exams, it is "open book / open notes", which means you can consult paper or electronic copies of the textbook and your notes, sample solutions *from this year only*, your own graded work, and anything on the course Web site. You may not use other books, materials from this course from previous years, a calculator or computer (except as needed to consult allowed sources), or any Web sources other than the course Web site. You should (of course?) work alone, although you're allowed to ask me questions. Some questions will be similar in format to those in the homework assignments; others will be multiple-choice or true/false. 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.

2 Lecture topics to review

You are responsible for all material presented during lecture; the following is a list of major topics to review:

- History/evolution of operating systems.
- Functions we would like an operating system to provide.
- What functionality we need (and/or can expect) from hardware in order to write a reasonable operating system.
- System calls.
- The process abstraction.
- Implementing processes (what's involved in a context switch, what kinds of things are in a process table, etc.)

- Processes versus threads.
- Why interprocess communication (IPC) is needed.
- Mechanisms for IPC (shared variables, semaphores, monitors, message-passing).
- IPC problems (mutual exclusion, producers/consumers, dining philosophers) and their solutions.
- Scheduling and scheduling algorithms.
- Deadlocks.

3 Reading to review

You should have read all of chapters 1 and chapter 2 and skimmed chapter 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 any non-opinion minute essay questions.