

Midterm Study Guide

CSCI 432: Spring 2009
16 March

You are responsible for anything we covered in class or in the projects, and everything in the assigned readings (i.e., the papers). This exam will focus on topics related to threads, concurrency, synchronization, and scheduling. You will **not** be tested on any newer material related to process and memory management.

The following list covers many of the topics we have touched on:

- Process and threads: differences and similarities.
- Atomic actions: what are they and why do we need them.
- Mutexes/Locks: general use and purpose.
- Monitors: general use and purpose.
- Semaphores: general use and purpose.
- Compare and contrast use of monitors versus semaphores.
- Classic synchronization problems covered in class: Bounded buffer (soda machine), got milk, dining philosophers, sleeping barbers.
- Producer-consumer and reader-writer synchronization problems and solutions.
- Implementing threads and locks: project 1, context switching, shared and private state, implementing synchronization primitives, test and set, interrupts.
- Deadlock: what conditions are required for deadlock.
- Mechanisms for deadlock avoidance (Banker's algorithm).
- Scheduling algorithms: FCFS, RR, STCF, STCF-P, EDF.
- Tradeoffs between scheduling algorithms.
- Papers: UNIX and Eraser (I won't ask about Lampson).