Review for Midterm

Operating Systems

Department of Computer Science
Rutgers University

Reminders

Bring photo id. Write name on all answer books.

Closed book. Closed notes. No calculators, PDAs, phones, etc.

Go to the bathroom before the exam starts.

No questions during the exam. If in doubt, make an assumption and write it down.

Be concise. Write just enough to answer questions.

Cheating will be punished severely!

2

Architecture

Caching. Why? Examples? When does it work well?

Invoking the OS. Mechanisms? Differences?

I/O event notification. Mechanisms? Differences?

Send/receive data to I/O devices. Mechanisms? Differences?

Processes and Threads

Stack. Activation records. What is stored there?

Heap. What is stored there?

Address space. What is it?

Process context. Thread context. What do they comprise?

PCB. TCB. Where are they stored? What do they store?

Context switching. How does it happen? Any problems?

Thread states.

User-level and kernel-level threads. Pros and cons?

Synchronization

Critical section. Locks. Condition variables. Barriers.
Semaphores. Monitors.

Atomic instructions. Examples?

Spinning vs. blocking. Tradeoff?

Deadlock. Necessary conditions? Techniques for tackling
deadlocks?

Banker's algorithm.

CPU Scheduling

Metrics: thruput, utilization, turnaround, response time, deadlines

Preemption.

Policies: FCFS, SJF, RR, Priorities, Feedback. Pros and cons.

Multiprocessor scheduling: load sharing, gang scheduling, hardware partitions. Pros and cons.

Memory Management

Paging. Segmentation. How do they work? Pros and cons?

Translation Lookaside Buffer. How does it work? How are misses handled?

Translation from logical (virtual) to physical address. How?

Page tables. Where are they stored? What can we do to reduce their size?

Page replacement policies: FIFO, LRU, Optimal, 2nd chance, Nth chance.

Working set. Thrashing. Swapping.