

Date: Monday, Dec 11
1:05pm to 3:05pm; please be there by 1pm
Location: MCB 216 (usual classroom)

Format:

The final exam will consist of 5-8 questions.

It will be **closed book, closed notes, closed computer/without wireless access**. However, you are **allowed to bring one letter-sized sheet of paper with prepared notes** (you may use front and back of that sheet.)

You are responsible for the content of lectures 1 through 27. This includes, among others:

- Introduction to OS: general goals & principles of operating systems.
- Threads & processes: context switching, mode switching, procedure switching, context management, threading & process APIs.
- Concurrency & Synchronization: critical section problem, race conditions, approaches for guaranteeing mutual exclusion, including locks, semaphores, monitors, spinlocks & disabling interrupts.
- Deadlock: conditions, detection & recovery.
- Scheduling: general goals & constraints, priority scheduling, FCFS, RR, SPN, MFLQS, Lottery Scheduling. Real-time Scheduling: RMA & EDF.
- Virtual memory basics: address translation, memory protection, page table & TLB management; physical memory management: buddy systems and bitmap-based allocation; virtual page replacement strategies, working set & thrashing; segmentation.
- Threading models: user-level threads, kernel-level threads, hybrid models.
- Disks & Filesystems: disk characteristics, buffer cache, general design of filesystems, file allocation & layout strategies including indexed files, directory representation and lookup, consistency in filesystems, write-ordering & journaling, virtual filesystem interfaces, volume management, RAID.
- Security & Protection: basic models and goals.
- Networking: basics of layered implementation, demultiplexing, and TCP/IP sockets.

More weight will be given to material covered since the midterm.

Silberschatz covers this material in Chapters 1-12, 14-15, and 19.1-19.5

The final may contain questions related to projects 0-4.