The Final Exam questions are based on the following:

- **ALL** the assignments
- **ALL** the projects
- The **Midterm exam**
- (Since some of the projects/assignment-questions are optional, the final exam has more than 100 point questions, each of which is considered a bonus question)

The Final Exam will be **CLOSED-Book/notes** (do **NOT** use any Electronic Devices including cell phones, computers,….please!). You may bring **TWO 11x8.5 letter-size CHEAT-SHEET** (double-sided printing/writing is OK).

There will be True-False, Multi-Choice, and Short-Answer (including simple calculations) questions in the Final Exam.

The following will 100% be in the Final Exam:

- Banker's Algorithms—pay attention to the following:
  - Chapter 7's example
  - Assignment#4 (7.20)
  - Project#6
- Virtual Memory Management—pay attention to the following:
  - Chapter 9' examples about LRU and FIFO algorithms
  - Assignment#5's (9.8)
  - Project#5
- Chapter 6—Process Synchronization:

- A#4 (6.16—about Fig 6.8 on page 233 and/or SLIDE 17 of Chapter 6 lecture PPT file).
- A#4 (6.29)—how to write a monitor
- 3 conditions for critical-section problems
- How to implement simple semaphore operations (wait(), and signal())

General knowledge about the following topics:

- PC~Mainfrmaes~Handheld devices~Network/distributing
- RT-OS, Embedded, Distributed OS
- System ~ application S/W
- Message passing ~ Memory Sharing
- Microkerkenel
- Boot process
- PCB
- Stack
- fork()
- pthread
- thread vs. process
- response time, throughput, turnaround time
- CPU~I/O bursts
- CPU Scheduling
  - RR, FCFS, SJF, Priority, preemptive…
- nice values
- race condition
- semaphore, spinlock, monitor
- deadlock

- current OS policy on deadlock
- binding (program compilation, link)
- logical vs. physical (memory) address space
- RAID (1, 2, & 5 levels)
- Worm, trapdoor, logical bomb
- Symmetric vs. asymmetric key (public-key)
- SSL
- Process/Data migration, load sharing
- Fixed routing, virtual routing, dynamic routing
- Location independence
- Memory cache
- Stateful file service
- File/directory structure & operations
- 4 conditions for deadlock
- 1st and 2nd Readers-Writers Problems
- Access matrix, capability/access lists

And pay attention to the following assignment questions:

- A#5's: 8.3, 8.4, 8.9, 8.11, 8.23; 9.8, 9.21, 9.23
- A#6's: 1, 2, 4, , 9, 12, 16
- A#7's: 1, 3, 5, 6, 11, 13, 16, 17, 18, 19, 22, 26
- Project#0/1: VMware

*****The question numbers above are the question numbers in the ASSIGNMENTs---some of the numbers match the questions numbers in the textbook while others don't---so please use the ASSIGNMENTS to refer to the "right" questions/topics.**********