



Midterm Exam Review

Xin Liu

Operating Systems

COP 4610

[Coverage]

- Total: 100 points;
- Attendance: 18 points;
- 5 points based on OS Introduction and Structure
- 50 points based on CPU Scheduling
- 19 points based on Mutual Exclusion
- 6 points based on Synchronization
- 2 points based on Deadlocks

[Introduction and History]

- Four phases of OS history
 - OS design goals
 - Time Sharing System
 - Batch System
 - Today's design trends

[OS Architecture]

- Dual-Mode Operation
- Address space

[CPU Scheduling]

- Creation of The First Process
 - Booting sequence
- Per-thread State Diagram

[CPU Scheduling]

- Scheduling Strategy

- FIFO
- RR
- SJF
- SRTF

- Definition

- Response Time
- Turnaround Time
- Wait Time

[Mutual Exclusion]

- Definitions
 - Atomic Operation
 - Race Condition
 - Mutual Exclusion
 - Synchronization
 - Critical Section
 - Busy Waiting

[Mutual Exclusion]

- Multi-Threaded Race Condition Problem

[Mutual Exclusion]

- The Working Mechanism, Advantages, and Disadvantages
 - Lock
 - Spinlock
 - Mutex
 - 80% of the exam questions will be based on assignments
 - 20% of the questions will test your ability to apply principles learned specifically in this section

[Synchronization]

- Producer-Consumer problem
- Condition Variables
 - Pthread_cond_wait
 - P operation and V operation
- Semaphore
 - Advantages
 - Disadvantages

[Deadlocks]

- Deadlocks
 - Condition
- Defensive Programming
 - assertion