

# CS341 - Operating Systems

## Study Guide for Exam #1

### Spring 2004

- Basic O/S Concepts (Chaps 1-3)
  - Types of Operating Systems and their characteristics
  - Operating System Services
  - System Calls - Mechanisms
  - Traps, exceptions, interrupts - similarities, differences
- Processes (Chap 4)
  - What is a process?
  - Process control block - what is it, what's in it
  - State of a process (Running, waiting, etc.)
  - Process creation - basic operation of fork, exec
  - Process termination
  - Interprocess communication models: sockets, remote procedure calls (RPCs)
    - \* Shared memory vs message passing
    - \* Direct vs indirect (mailbox) communication
    - \* Blocking vs non-blocking
    - \* Producer-consumer concept
  - Distributed process communication - sockets, remote procedure call (RPC)
- Threads (Chapter 5)
  - Threads vs processes - what's the difference?
  - User vs kernel threads
  - Thread models, mapping of user threads to lightweight processes (LWPs)
- CPU Scheduling (Chapter 6)
  - Scheduling goals
  - Scheduling algorithms - advantages and disadvantages of:
    - \* FCFS
    - \* SJF
    - \* RR
    - \* Priority
    - \* Multiple algorithms
  - Simulating one scheduling algorithm with another
- Process Synchronization (Chapter 7)
  - Critical Section problem
  - Software solutions to mutual exclusion
  - Hardware solutions to mutual exclusion (i.e., test-and-set instruction)
  - Semaphores - conceptual operation, actual implementation