Please consider the associated Links and References (Canvas, On-Line) provided in the class schedule.

## Main topics:

- Ch 9: Main Memory
  - Process Creation and Memory Space
  - Contiguous Allocation
    - Single Allocation
    - Fixed (static) Partitioning
      - Internal Fragmentation
    - Dynamic Partitioning
      - External Fragmentation (holes)
      - Compaction
    - Buddy Algorithm
  - Placement Algorithm
    - First-fit, Next-fit, Best-fit, and Worst-fit
  - o Address Binding
    - Logical/Relative Address to Physical Address
  - Page Memory Management
    - Page, Frame, Page Table
    - Address Translation Scheme
    - Page Table Implementation
      - TLB
      - Hierarchical Paging
      - Hashed Page Tables
      - Inverted Page Tables
  - Segmented Memory Management
    - Address Translation Scheme
  - Segmented Page Memory Management

## • Ch 10: Virtual Memory

- What is it? Virtual Memory Space
- o Demand Paging
- Valid-Invalid bit (vs. modify/dirt bit, reference/used bit)
- Page Fault
  - What is it?
  - Handling Page Fault
- Performance od Demand paging
- Page Replacement
  - Modify/dirty bit
- Demand Paging Algorithms
  - Page-replacement Algorithm
    - Optimal
    - FIFO
      - o Belady's Anomaly and Stack Algorithms

- LRU (Least Recently Used)
- LRU Approximation
  - o Additional-Reference-Bits Algorithm
  - Second-Chance Algorithm
    - Clock Algorithm
    - Enhanced Algorithm
- Counting-Based Page Replacement
- LFU (Least Frequently Used)
- MFU (Most Frequently Used)
- Frame-allocation Algorithm
  - Resident Set Management
    - Fixed-allocation vs. Variable-allocation
  - Replacement Scope
    - Global vs. Local
    - Thrashing

## • Ch 11: Massive Storage Systems

- Overview of Mass Storage Structure
- Disk Structure
- Disk Scheduling Algorithms
  - First Come First Served (FCFS)
  - Shortest Seek Time First (SSTF)
  - SCAN/Elevator, C-SCAN, C-LOOK