1- Memory Hierarchy
   a. Types of Memory
      i. SRAM and SRAM arrays
      ii. DRAM and DRAM arrays
      iii. Magnetic memory
      iv. Optical memory
      v. EEPROM
      vi. Memristors
   b. Memory devices
      i. Register Files
      ii. Caches
         1. Cache locality
         2. Cache Addressing
         3. Multi-Level Caching
      iii. The RAM
         1. RAM pages and MMU
         2. RAM management – Paging
            a. Paged Map Allocation
            b. Demand Paging
            c. Segmented Memory Allocation
      iv. The Hard Disk Drive
         1. Clusters and grains
         2. Tracks and sectors
2- Memory management:
   a. Data Propagation
   b. RAM Management – replacement policies
      i. FIFO
      ii. LRU
   c. Cache Management
      i. Mapping
      ii. Cache misses and hits
      iii. Direct mapping
      iv. Fully Associative
      v. K-Way associative
      vi. Miss rate and hit rate
3- Processes:
   a. What is a process?
   b. The address space
   c. Reserved registers and System calls
   d. Process states and models (everything related to those models is fair game)
      i. Embedded system model

      ii. The batch system model
- e. Process control blocks
- f. Process scheduling
  - i. Non-pre-emptive schemes
    1. Properties of Non-pre-emptive schemes
    2. FCFS
    3. SJN
    4. Priority Scheduling
  - ii. Pre-emptive schemes
    1. Properties of Pre-emptive schemes
    2. SRT
    3. Round Robin
  - iii. Context switching
- g. Computer Arithmetic
  - i. Number representations in binary
    1. Whole numbers
    2. Integers
       a. Positive numbers
       b. Negative numbers
    3. Rational Numbers
       a. Rational numbers representation
       b. IEEE 32-bit standard
    4. Operations on binary
       a. Addition
          - i. Addition on binary
          - ii. Adders:
            1. Ripple adders
            2. Carry skip adders
            3. Carry Look-Ahead adder
       b. Subtraction
       c. Multiplication