

CSCI 360: Introduction to Operating Systems

Midterm Exam: **Closed Book**

Location: **Building 356, Room 319**

Total Marks: **80**

Duration: **80 minutes**, starting from **1:00 PM, October 26, 2022**.

Exam Mode and Question Types

1. Exam will be **in person**.
2. The exam will have **analytical, problem solving** and **pseudo-code** questions on the topics listed below.

Topics

1. Introduction
 - a. What is Operating System
 - b. Operating System Roles
 - i. Extended Machine
 - ii. Resource Manager
 - c. Operating System Components.
 - d. Operating System Modes
 - i. User Modes
 - ii. Kernel Modes
 - e. System Calls
 - f. Operating System Architecture
 - i. Monolithic
 - ii. Microkernel
2. Process Management
 - a. Process Abstraction
 - b. Process Operations
 - c. Process States
 - d. Process Control Block
 - e. Thread

- f. User and Kernel Threads
 - g. Thread Library (pthread)
 - h. Process Scheduling
 - i. Process Cycles (CPU Burst and I/O Burst)
 - ii. Process Queues (Ready and I/O)
 - iii. Context Switching
 - iv. Batch, Interactive, and Real-time Systems
 - v. Preemptive and Nonpreemptive Scheduling
 - vi. First Come First Serve Scheduling
 - vii. Shortest Job First Scheduling
 - viii. Shortest Remaining Time First Scheduling
 - ix. Priority Scheduling
 - x. Round Robin Scheduling
 - xi. Multiple Queues Scheduling
 - xii. Guaranteed Scheduling
 - xiii. Lottery Scheduling
 - xiv. Fair-share Scheduling
 - i. Inter Process Communications (IPC) Mechanisms
 - i. Shared Memory
 - ii. Message Passing
 - iii. Pipe
3. POSIX system calls and the library functions covered so far in the example codes of the course.
4. POSIX system calls and the library functions covered in Assignment 1 and 2.