Ira A. Fulton Schools of Engineering
Arizona State University

Course Syllabus
Operating Systems

Course Description

Operating system is the software that supports a computer's basic functions, such as scheduling tasks, executing applications, and controlling peripherals.

Specific topics covered include:

- Introduction to Operating Systems
- CPU Scheduling Concepts
- Concurrent Processes
- Memory Management

Learning Outcomes

Learners completing this course will be able to:

- Define the key components and terminologies in operating systems.
- Distinguish between threads and processes.
- Explain the mechanisms used in different OS components such as context switching, CPU scheduling, memory management and input output.
- Analyze the efficiency and execution times of algorithms related to CPU scheduling, memory management, process synchronization, and deadlock handling.

Course Structure

After reviewing the course materials for these objectives, you will have the opportunity to take ungraded practice quizzes. This is to make sure you have mastered the learning objectives.

Once you have mastered all of the course learning objectives, you will be prepared to take the Final Exam. After passing the final exam with an 80% or better, you would have completed CSE 330: Operating Systems prerequisite for ASU's Master of Computer Science degree.

Course Materials

You do not need to purchase materials for this course. If you would like an additional resource, a textbook is suggested called Operating System Concepts, Silberschatz, Gagne, Galvin. [An older version of the textbook would work; you do not need the latest version.]

Time Commitment Per Module

- Module 1 (2 hours)
- Module 2 (3 hours)
- Module 3 (2 hours)
- Module 4 (3 hours)
- 90 min for Final Exam

Time estimates are based on content provided in the course; additional readings outside the course have not been factored in these time estimates.

Course Grade Breakdown

Course Work	Quantity	Percentage of Grade
Final exam	1	100%

Grade Scale

You will need to pass the final exam with an 70% or better, and successfully pass proctoring requirements for the final exam.

Module 1: Introduction to Operating Systems

1.0: Overview
1.1: Interrupts
1.2: Resident Monitor Efficiency, Issues and Enforcement
1.3: CPU and Memory Protection
1.4: Practice Quiz

Module 2: CPU Scheduling Concepts

2.0: Overview
2.1: Processes and Programs
2.2: Process Memory States (context switching)
2.3: CPU Scheduling (non-preemptive scheduling)
2.4: CPU Scheduling Metrics
2.5: CPU Preemptive Scheduling
2.6: Comparing Scheduling Algorithm
2.7: Practice Quiz

Module 3: Concurrent Processes

- 3.0: Overview
- 3.1: Concurrent Programming Algorithms
- 3.2: Hardware Based Solutions
- 3.3: Readers and Writers
- 3.4: Practice Quiz

Module 4: Memory Management

- 4.0: Overview
- 4.1: Memory Management Fundamentals
- 4.2: Solutions to Fragmentation
- 4.3: Paging
- 4.4: Demand Paging and Segmented Paging
- 4.5: Page Replacements
- 4.6: Practice Quiz

Course Completion

- Final Exam Proctoring Setup
- Final Exam