Course Title:	Operating Systems
Semester:	Spring 2023
Course Code:	CS-2006
Pre-requisite:	Data Structures, and Computer Organization
Office Hours:	Tuesday: 12:00 to 1:00, Thursday: 12:00 to 1:00 [email me to schedule a meeting]
Instructor:	Muhammad Saifullah (Email: saifullah.tanvir@lhr.nu.edu.pk)

Objective
"Operating systems are essential part of any computer system. Similarly, a course on operating systems is an essential part of any computer science education." (Silber Schatz et. al.)

This course helps in understanding the behavior, role and scope of operating system, the underlying hardware, and the application programs. Secondly, in this course students learn how to program in a multi-programmed and multithreaded environment. The course also introduces important system development methodologies and algorithms in the areas of CPU scheduling, process communication, memory management, concurrency, synchronization, and file systems.

Textbook
Operating System Concepts (Tenth Edition)
By Silber Schatz, Galvin, and Gagne

Additional Readings
Operating Systems (Third Edition)
By Gary Nutt

The Little Book of Semaphores (Second Edition)
By Allen B. Downey

Weightages (Tentative)

Quizzes	10%
Assignments	15%
Two Midterm Exams	30%
Final Exam	45%

Passing Criteria
A student must secure at least 50% marks to pass the course.

Attendance Policy
Students are expected to attend all sessions. However, they might avail 20% leaves in emergency situations. Beyond this the student will not be allowed to appear in the final exam.

Plagiarism

Plagiarism is not tolerable in any of its form. Minimum penalty would be an 'F' grade in the course. Students bear all the responsibility for protecting their assignments. In case of cheating, both parties will be considered equally responsible.

Late Submissions

Assignments must be submitted on time. Late submissions will not be accepted.

Lecture Plan (Tentative)

	Topic
Processes, Process Communication, and Threads	Introduction and Background
	Introduction to Process Management
	Fork, wait, execlp
	Inter-process Communication Linux pipeline
	Multithreading Models Thread Libraries Exploiting processing and I/O in parallel
Scheduling and Synchronization	Process Scheduling Basic Concepts
	Scheduling Algorithms
	Synchronization Critical Section Problem and its Solutions
	Semaphores Classical Problems
Memory Management, and File Systems	Memory Management Challenges Paging
	Virtual Memory Demand Paging Page Replacement Algorithms
	File System – Introduction Allocation Methods
	Free-Space Management Implementation
	Some Optional Topics if time permits (deadlocks, makefile, sockets, etc.)

Grading Scheme:

Absolute grading scheme will be used.