

Course Title:	Operating Systems
Semester:	Spring 2022
Course Code:	CS-220
Pre-requisite:	Data Structures, and Computer Organization
Office Hours:	Monday: 11:00 to 12:30, Wed: 10:00 to 12:00
Instructor:	Razi Uddin(Email: <a href="mailto:razi.uddin@nu.edu.pk">razi.uddin@nu.edu.pk</a> )

### 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.” (Silberschatz et. al.)

This course helps in understanding the behavior, role and scope of operating system, the underlying hardware, and the application programmes. 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.

### Text Book

Operating System Concepts (Tenth Edition)  
By Silberschatz, 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	20%
Two Midterm Exams	30%
Final Exam	40%

### 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
Memory Management, and File Systems	Classical Problems
	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.