Course Title: Operating Systems

East Delta University
School of Science, Engineering & Technology
Engineering Program Course Syllabus Summer 2025
Course Code: CSE 311
Credit Hours: 3

Instructor details
Name: SARAF ANIKA
Designation: Assistant Professor
E-mail: saraf.a@eastdelta.edu.bd
Student Consultation Hour: Based on Appointments
Sunday: 2PM to 2:30PM, Monday: 11:30AM to 12PM, Tuesday: 2PM to 2:30PM, Wednesday: 2PM to 2:30PM

Course Description

The operating system is a computer's chief manager overseeing interactions between users, applications, shared software and hardware resources. This course covers the fundamentals of operating system design and implementation. Lectures present the central ideas and concepts such as synchronization, deadlock, process management, storage and memory management, file systems, security, protection, networking and virtualization.

Learning Objectives

On successful completion of this course students will be able to:

- Explain basic abstraction techniques employed by operating systems
- Explain trade-offs made by particular operating system designs
- Understand components of an OS by implementing different ones through a series of five, challenging and programming-intensive labs in Assembly and C.
- Synthesize a set of design principles that are useful for building large systems
- Analyze, critique and debate research articles on system design

Textbooks & Required Reading

- Operating System Concepts by Silberschatz, Galvin & Gagne, 10th edition.
- Modern Operating Systems by Andrew S. Tanenbaum & Bos, 4th edition.

Detailed Class Schedule & Contents

Chapter	Topics	Learning Outcome
One: Introduction	☐ What Operating Systems Do ☐ Computer-System Organization ☐ Operating-System Structure ☐ Operating-System Operations	☐ To describe the basic organization of computer systems. ☐ To provide a grand tour of the major components of operating systems.
One: Introduction	☐ Operating-System Architecture ☐ Process Management, Memory Management, Storage Management ☐ Kernel Data Structures ☐ Computing Environments ☐ Open-Source Operating Systems	☐ To provide a grand tour of the major components of operating systems. ☐ To give an overview of the many types of computing environments. ☐ To explore several open-source operating systems.
Three: Processes	☐ Process Concept ☐ Process Scheduling	☐ To introduce the notion of a process -- a program in execution, which forms the basis of all computation ☐ To describe the various features of processes, including scheduling, creation and termination, and communication
Three: Processes	☐ Operations on Processes ☐ Interprocess Communication, Examples of IPC Systems ☐ Communication in Client-Server Systems	☐ To explore interprocess communication using shared memory and message passing ☐ To describe communication in client-server systems
Five: Process Synchronization	☐ The Critical-Section Problem ☐ Synchronization Hardware	☐ To present the concept of process synchronization. ☐ To introduce the critical-section problem, whose solutions can be used to ensure the consistency of shared data

Five: Process Synchronization	Mutex Locks Semaphores	To present both software and hardware solutions of the critical-section problem
Five: Process Synchronization	Classic Problems of Synchronization Synchronization Examples	To examine several classical process-synchronization problems To explore several tools that are used to solve process synchronization problems
Seven: Deadlocks	System Model Deadlock Characterization Methods for Handling Deadlocks Deadlock Prevention	To develop a description of deadlocks, which prevent sets of concurrent processes from completing their tasks
Seven: Deadlocks	Deadlock Avoidance Deadlock Detection Recovery from Deadlock	To present a number of different methods for preventing or avoiding deadlocks in a computer system
Eight: Main Memory	Background Swapping Contiguous Memory Allocation	To provide a detailed description of various ways of organizing memory hardware
Eight: Main Memory	Segmentation Paging	To discuss various memory-management techniques, including paging and segmentation
Eight: Main Memory	Structure of the Page Table Example: The Intel 32 and 64-bit Architectures Example: ARM Architecture	To provide a detailed description of the Intel Pentium, which supports both pure segmentation and segmentation with paging
Case Studies	Linux System, Windows 7 System	Detailed Examination of real time operating systems

- **There will be Two CTs; 1 before MID, another after MID. Both CTs will be counted for Final Result.**
- **No Makeup Assessment will be taken instead of any of the mentioned Assessment Criteria in the Marks Distribution Section.**

Grading Policy:

Percentage (Marks)	Letter Grades	G.P.A
93% & Above	A	4.0
89% – <93%	A-	3.7
86% – <89%	B+	3.3
82% – <86%	B	3.0
79% – <82%	B-	2.7
75% – <79%	C+	2.3
72% – <75%	C	2.0
69% – <72%	C-	1.7
65% – <69%	D+	1.3
60% – <65%	D	1.0
<59%	F	0.0

Marks Distribution:

S/L	Criteria	Weight
1	Continuous Assessment (a): (Quiz, Short Write-up, Surprise Test, Group Work, Class Test etc.)	30
2	Class Attendance	5
3	Assignment/VIVA	10
4	Midterm Assessment / Assignment / Presentation / Viva	25
5	Final Assessment / Assignment / Presentation / Viva	30