

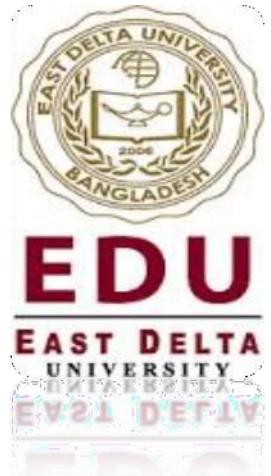
## East Delta University

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](mailto: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, 10<sup>th</sup> edition.
- Modern Operating Systems by Andrew S. Tanenbaum & Bos, 4<sup>th</sup> edition.

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

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