Faculty of Engineering Sciences and Technology (FEST)

Course Name	: Operating Systems
Pre-requisites, if any	: Basics of Computer System Architecture, Data Structures
Semester	: IV
Offered in	: B. Tech in CSE (AI-ML) / B.Tech in ICT
Credit Points	: 5 (LTP: 4-0-2)

Course Outline:

Unit	Content	Hrs.
1	**Introduction:** Overview, Operating System Architecture, Features of OS, Types of OS, Functionalities of OS, Generations of OS, System Calls, Kernel, System Boot	5
2	**Process management:** Process Concept, Process Scheduling, Scheduling Approaches, FCFS, SJF, SRTF, RR, RT, Priority scheduling, Process Control Block Threads: Concepts, Multicore programming, Types of Threads, Thread Management, Multithreading, Compare and Contrast Threads and Process	12
3	**Deadlocks:** Characterization of Deadlocks, Handling Deadlocks, Deadlocks Detection, Deadlock Avoidance, Deadlock Prevention, Deadlock Recovery **Inter-process communication:** Concepts of Synchronization, Critical Section Problem, Mutual Exclusion, Mutex Locks, Semaphores, Monitors	8
4	**Security and Protection:** Risks and issues in OS, Principles of Protection, Access Control, Security Goals, Attacks, Encryption, Program Threats, Authentication, Firewalls	10
5	**Memory Management:** Need for Memory Management, Memory Allocation, Partitioning, Contiguous Memory Allocation, Fragmentation, Swapping, Segmentation, Paging, Page Table, Page Replacement Methods, Thrashing, Virtual Memory: Concepts, Virtual Memory Management	10