

Course Title	Operating Systems
Course Code	CC-311
Credit Hours	3
Category	Computing Core
Prerequisite	CC-213: Data Structures and Algorithms
Co-Requisite	None
Follow-up	DI-323: System and Network Administration
Course Description	Introduction: Operating systems basics, system calls, process concept and scheduling, inter-process communication, multithreaded programming, multithreading models, threading issues. Process Scheduling: Algorithms, thread scheduling, multiple-processor scheduling, synchronization, critical section, synchronization hardware, synchronization problems, deadlocks, detecting and recovering from deadlocks. Memory Management: swapping, contiguous memory allocation, segmentation & paging, virtual memory management, demand paging, thrashing, memory-mapped files. File Systems: file concept, directory and disk structure, directory implementation, free space management, disk structure and scheduling, swap space management. System Protection: Virtual machines, operating system security.
Text Book(s)	1. A. Silberschatz, P. B. Galvin, G. Gagne, Operating Systems Concepts, 9 th Edition, Wiley, 2012, ISBN: 1118063333.
Reference Material	1. Andrew S. Tanenbaum, Herbert Bos, Modern Operating Systems, 4th Edition, Pearson, 2014, ISBN: 013359162X. 2. William Stallings, Operating Systems: Internals and Design Principles, 9th Edition, Pearson, 2017, ISBN: 0134670957.