Course Code	Course Name	Course Type	Cd	L	T	P	Marks		
							Sessional	Final Exam	Total
COM-302	Operating Systems	PCC	4	3	1	0	50	100	150

Course Outcomes

	At the end of the course the student will be able to:
CO1	Demonstrate understanding of the concepts, structure and design of operating systems.
CO2	Articulate the general architecture of modern computer operating systems including its impact on application design and performance.
CO3	Understand and analyze complex design choices and implementation details of: processes, resource control, physical and virtual memory, scheduling, I/O and files.
CO4	Develop understanding of inter process communication and synchronization mechanisms.
CO5	Analyze the interplay and conflicts in resource usage in a multi-user, multi-tasking environment with an understanding of the trade-offs involved.

Detailed Syllabus
Section-A

Unit 1: Introduction Concepts: Operating System functions and characteristics, Historical evolution of O.S., O.S. Services, User O.S. Interface, Computer System Architecture, O.S. Design, Implementation and structure, System calls, System Programs, Virtual Machines, Spooling.

(4 hours)

Unit 2: Process Management: Study of state models, process Scheduling, Job Scheduling, Scheduling Criteria, Scheduling Algorithms, Multiple Process Scheduling.

(6 hours)

Unit 3: Process Coordination: Synchronization: Race-Conditions, critical–Section problems, semaphores, Bounded-Buffer Problem, Readers-writers Problem, Dining –Philosophers Problem.
Deadlocks: Characteristics, Deadlock Prevention, Avoidance, Detection and Recovery.

(12 hours)

Section-B
Unit 4: Memory Management: Logical and Physical Address space, Contiguous and Non-Contiguous Memory Allocation, Paging, Structure of Page Table, Segmentation, Demand paged memory management, Page replacement, Allocation of Frames, Thrashing, Swapping and Overlays, Cache Memory.

(12 hours)

Unit 5: File Systems and Disk Storage: Files: file concept, file structure, types, access methods, directory structure, allocation methods (contiguous, linked, and indexed), free-space management (bit vector, linked list, grouping), Disk Structure, Disk Scheduling, Disk Management, Disk Formatting, Swap Space Management, RAID Structure.

(6 hours)

Text Books

S. No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Operating System Concepts	Abraham Silberschatz, Peter B. Galvin, Gerg Gagne	Wiley	9th (2015)

Reference Books

S.No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Operating System	H. M. Deitel	Pearson	3rd (2007)