

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	Describe the concepts, architecture and design of operating systems.
CO2	Evaluate process scheduling algorithms and inter-process communication mechanisms.
CO3	Implement the resource control by using scheduling algorithms and I/O files.
CO4	Explain memory management techniques, including paging, segmentation, and virtual memory.
CO5	Analyze the interplay and conflicts in resource usage in a multi-user, and multi-tasking environment.

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 Hrs.)**

Unit 2: Process Management: Study of state models, process Scheduling, Job Scheduling, Scheduling Criteria, Scheduling Algorithms, Multiple Process Scheduling. **(6 Hrs.)**

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 Hrs.)**

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 Hrs.)**

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 Hrs.)**

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	10th (2021)
2	Operating System Design and Implementation	Andrew S. Tanenbaum	Pearson Education	3rd (2015)

Reference Books

S.No.	Name of the Books	Author	Publisher	Edition (Pub. Yr.)
1	Operating Systems: Internals and Design Principles	William Stallings	Pearson Education	9th (2018)
2	Schaum's Outline of Operating Systems	J. Archer Harris	McGraw Hill	1st (2020)