

CSMC 202: Advanced Operating System

MODULES	HOURS
Introduction: Distributed system, distribution transparency, loosely couple versus tightly coupled system architecture, distributed shared memory.	3
Message Passing: Inter-process communication, group communication, broadcasting algorithms, case study with MPI.	3
Clock synchronization: Event ordering, event precedence, Logical Clock model, Vector Clock.	3
State Recording: Naïve State Recording algorithm, Chandy-Lamport's state recording algorithm.	3
Mutual exclusion in distributed environment: Ricart-Agrawala Algorithm, Token based ME algorithm for Ring topology, Raymond's Algorithm	6
Deadlock detection for Distributed Systems: Mitchell-Merritt Algorithm, Ho-Ramamurthy Algorithms, Termination Detection algorithm – weight-throwing algorithm, diffusion computation algorithm.	4
Process Management: Process migration, Pre-emptive and non-preemptive process migration, Resource migration, Resource-Process binding, Resource-Machine binding, Challenges and limitations for creating global references for resources	6
Remote Procedure Call: RPC Model, stub generation, server management, parameter passing, call semantics, communication protocols, Client-Server binding, exception handling, security, optimization, Case study on SUN RPC.	8
Distributed File Systems: System wide deployment of DFS, Client-Server model for DFS, Indexed Block model for DFS, Case study on Hadoop File System, Naming in distributed systems, directory services, DNS.	4
Books:	
1. Mukesh Singhal, Niranjan Shivaratri: Advanced Concepts in Operating Systems, Tata McGraw-Hill Education, 2001.	
2. S. Tanenbaum: Distributed Operating Systems, Prentice Hall of India, New Delhi, 1996.	
3. G. F. Colouris, J. Dollimore and T. Kindberg: Distributed Systems: Concepts and Design, 2nd ed., Addison-Wesley, Reading, Mass., 1994.	
4. S. J. Mullender (Ed.): Distributed Systems: An Advanced Course, 2nd ed., Addison-Wesley, Reading, Mass., 1993.	
5. P. K. Sinha: Distributed Operating Systems, IEEE Press, Los Alamos, California, 1997.	