



Department of Computer Science & Engineering

Course Handout: Distributed Operating System (DOS)

Course Code- CS802

No. of Credits: 3

Lecture: 3-Hr/Week

Class & Sem.: B.Tech.(Hons.) CSE 8Th Sem.

Faculty: Dr. B K Singh

Objectives:

To gain depth knowledge of challenges and issues of distributed Operating Systems. Also, to understand the operating system principles, Distributed Computing techniques, Synchronization and Processes, Shared Data access files And Case study.

Course Plan

Module No.	Topics to be covered	No.of Lecture	Chapter of Text Book
1	Unit -I		
	Introduction to Distributed systems, Advantages of Distributed Systems over Centralized Systems.	2	T1-Ch.-1
	Examples of Distributed Systems	1	T1-Ch.-1
	Various Paradigms in Distributed Applications Challenges-Heterogeneity, Openness, Failure handling, Concurrency, Transparency	2	T2-Ch.-1
	Remote Procedure Call-Basic RPC operation, parameter passing,	2	T1-Ch.-2
	Unicasting , Multicasting and Broadcasting	1	T1-Ch.-2
	Group Communication	1	T1-Ch.-2
2	Unit -II		
	Issues in Distributed Operating System- Global Knowledge, Naming, Scalability, process synchronization, Client server computing model	2	T1-Ch.-2
	Threads in Distributed Systems –Introduction to threads, Threads in DSArchitecture for multithreaded server, thread synchronization, thread scheduling, threads implementation	1	T1-Ch.-4
	Clock Synchronization-Physical Clocks, Clock Synchronization Algorithm,	1	T1-Ch.-3
	Clock Synchronization - Logical Clocks, Lamport timestamps, Vector Timestamps.	1	T1-Ch.-3
	Causal Ordering –Capturing causality, examples of using causality, Limitations	1	T1-Ch.-3
	Election Algorithms-The Bully Algorithm and Ring Algorithm	1	T1-Ch.-3
	Distributed Mutual Exclusion – Distributed Transactions	1	T1-Ch.-3
	Distributed Deadlock -Phantom Deadlocks, edge caching, and transaction priorities.	1	T1-Ch.-3

3	Unit-III		
	Distributed File Systems – Introduction and Design, Comparison with the traditional file systems	2	T1-Ch.-5
	Distributed Shared Memory – Introduction, design and implementation issues.	2	T1-Ch.-6
	Distributed Shared Memory –sequential consistency and release consistency	1	T1-Ch.-6
	Shared-variable distributed shared memory	1	T1-Ch.-6
	Object-based distributed shared memory	2	T1-Ch.-6
4	Unit IV		
	Introduction to Fault Tolerance-Basic Concepts	1	T1-Ch.-4
	Failure models, Failure Masking by Redundancy	1	T1-Ch.-4
	Distributed Commit Protocols-Two phase Commit, Three Phase Commit,	2	T1-Ch.-4
	Byzantine Fault Tolerance.	2	T1-Ch.-4
5	Unit -V		
	Case Study – Amoeba INTRODUCTION TO AMOEBA, History of Amoeba, Research Goals	1	T1-Ch.-7
	OBJECTS AND CAPABILITIES IN AMOEBA Capabilities, Object Protection, Standard Operations	2	T1-Ch.-7
	MEMORY MANAGEMENT IN AMOEBA – Segments, Mapped Segments	1	T1-Ch.-7
	Group Communication – FLIP - Amoeba Servers	1	T1-Ch.-7
	Introduction to MACH - Process Management - Memory management – Communication	1	T1--Ch-8
	Object Oriented Subsystem:COOL	2	T1-Ch.-9
Total Lectures:40			

Text Books:

1. Tanenbaum Andrew, Distributed Operating System, Seventeenth Edition Reprint, First Edition – 2006, Pearson India
2. Andrew S. Tanenbaum, M.V. Steen, Distributed System, 2nd Edition, 2007, PHI LEARNING

References:

1. Jean Dollimore, Tim Kindberg, George Coulouris, Distributed System, 5Th Edition, 2011, Pearson India.
2. Pradeep K. Sinha, Distributed Operating System Concept and Design, First Edition, 2009, PHI Learning

Grade Evaluation Scheme

S.No	Evaluation Component	Durat ion	Weightage
1	Mid Sem examination	2 Hrs.	30%
3	End Sem examination	3 Hrs.	40%
4	Teacher's Assessment		20%