Distributed Computing Systems - Web course

COURSE OUTLINE

The course is intended to provide basic foundation with fundamental concepts and mechanisms of distributed computing systems. Most of the issues discussed in this course material are the essence of advanced operating systems.

Broad coverage as follows:

1. Introduction to distributed computing systems (DCS)
2. DCS design goals, Transparencies, Fundamental issues
3. Distributed Coordination
4. Process synchronization
5. Inter-process communication
6. Deadlocks in distributed systems
7. Load scheduling and balancing techniques
8. Distributed database system : A Case study

COURSE DETAIL

Sl. No	Topic	Hours
1.	**Basics concepts** • Computer architecture : CICS, RISC, Multi-core • Computer networking : ISO/OSI Model • Evolution of operating systems • Introduction to distributed computing systems (DCS)	6
2.	DCS design goals, Transparencies, Fundamental issues	3
3.	**Distributed Coordination** • Temporal ordering of events • Lamport's logical clocks • Vector clocks; Ordering of messages • Physical clocks • Global state detection	7
4.	**Process synchronization**	6

NP-TEL

NPTEL

http://nptel.iitm.ac.in

Computer Science and Engineering

Pre-requisites:

- Operating Systems
- Computer Networks
- Database System

Additional Reading:

Nil

Hyperlinks:

Nil

Coordinators:

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	• Distributed mutual exclusion algorithms • Performance matrix	
5.	**Inter-process communication** • Message passing communication • Remote procedure call • Transaction communication • Group communication; Broadcast atomic protocols	6
6.	Deadlocks in distributed systems	4
7.	Load scheduling and balancing techniques	5
8.	Distributed database system : A Case study	3
	Total	**40**

References:

1. Distributed Systems Concepts and Design, G. Coulouris, J. Dollimore, Addison Wesley
2. Advanced Operating Systems, M. Singhal, N.G. Shivarathri, McGraw Hill
3. Distributed Operating Systems and Algorithms, Randy Chow, T. Johnson, Addison Wesley
4. Distributed Operating Systems, A.S. Tanenbaum, Prentice Hall
5. Principles of Distributed Database Systems, M. Tamer Ozsu, Patrick Valduriez, Prentice Hall International