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|  | **DISTRIBUTED SYSTEMS AND NETWORKS** |
| **Topics** |  |
| **Week 1/2** | **Overview**  **Introduction to Distributed Systems**   * Hardware Concepts * Distributed Operating System * System / coupling types * The middleware * Design issues of Distributed Systems * Components of a Distributed System |
| **Week 2/3** | **Features and types of distributed systems**.   * Communications in Distributed Systems * Models of Communication in a Distributed Computing System * Multicasting * Applications of client server * Protocols and Networks * Client – server model * Characteristics of Distributed Computing Systems. * Advantages of Distributed Systems * **ASSIGMENT 1** |
| **Week 4&5** | * Inter Process Communication (IPC) * MI (Remote Method Invocation) * Creating Distributed Applications Using RMI * Remote Procedure Call (RPC) * Failure Handling * Distributed Systems and Object Oriented Models   **CAT 1** |
| **Week 6** | **Distribution Transparency**   * Definition * Transparency choices * Different transparencies * Issues in Design of Distributed Computing systems |
| **Week 7** | **Synchronization**   * Types of clocks * Clock Synchronization * Mode of Synchronization * Synchronization Algorithms |
| **Week 8** | **Directory Services**   * Terminology * Names, Identifiers and Addresses * Name Spaces * Name Resolution * Implementing a Directory Service * Name Space Distribution * Iterative name resolution * Application |
| **Week 9** | **Atomic transactions**   * Transaction implementation * Concurrency control approaches * Optimistic Concurrency control   Deadlocks in distributed systems   * Algorithms used in DS * Processes and Processor * **ASSIGNMENT 2** |
| **Week 10/11** | Fault Tolerance   * Basic Concepts * Dependability * Generally Faults classification * Design approaches suggested for building dependable distributed systems exhibit a high level of stability and fault tolerance. * Failure Models * Failure Masking by Redundancy * TMR (Triple Modular Redundancy) |
| **Week 12** | * **Sitting CAT 2** * Presentations |
| **Week 13/14** | Distributed File SystemsFile service modelImplementation VariancesCachingClass time and replicationSun Network File system  * Application   **File Replication**   * Definition * Advantages of file replication. * Replication transparency * Replication control. * Replication process |
| **Week 14** | **Security**   * Distribution of security mechanisms, * Access control * security management * Security threats * Security measures * Application |
| **Week 15** | **Examinations/Revision** |
| **Teaching Methodology** | * Lectures and tutorials * Group discussions * Demonstration * Individual assignment |
| **Instructional Material/ Equipment** | * Audio Visual aids in lecture rooms and theatre rooms * Virtual * E-materials |
| **Assessment** | A learner is assessed through ;   * Continuous Assessment Tests (CATs) (30%) * End of semester examination (70%) |
| **Required Text Books** | Required text and materials DISTRIBUTED SYSTEMS Second Edition Andrew S.Tanenbaum Maarten Van Steen |
| **Text Books for Further Reading** |  |
| **Other Support Material** | * Various application manuals and journals * Computer with Internet access is required. * Internet materials |