I Year I Semester	L	P	C
Code: 17CS105	4	0	3

ADVANCED OPERATING SYSTEMS

UNIT-I:
Architectures of Distributed Systems–System Architecture types-issues in distributed operating systems - communication networks - communication primitives. Theoretical Foundations – in herent limitations of a distributed system - lamp ports logical clocks - vector clocks - casual ordering of messages - global state - cuts of a distributed computation - termination detection. Distributed Mutual Exclusion-introduction-the classification of mutual exclusion and associated algorithms-acomparative performance analysis.

UNIT-II:
Distributed Deadlock Detection -Introduction - deadlock handling strategies in distributed systems -issues in deadlock detection and resolution - control organizations for distributed deadlock detection -centralized and distributed deadlock detection algorithms -hierarchical deadlock detection algorithms. Agreement protocols - introduction-the system model, a classification of agreement problems, solutions to the Byzantine agreement problem, applications of agreement algorithms. Distributed resource management: introduction-architecture-mechanism for building distributed file systems-design issues-log structured file systems.

UNIT-III:
Distributed shared memory-Architecture- algorithms for implementing DSM - memory coherence and protocols-design issues. Distributed Scheduling-introduction-issues in load distributing-components of a load distributing algorithm - stability - load distributing algorithm – performance ecomparison - selecting a suitable load sharing algorithm- requirements for load distributing –task migration and associated issues. Failure Recovery and Fault tolerance: introduction- basic concepts -classification of failures - backward and forward error recovery, backward error recovery- recovery in concurrent systems - consistent set of check points - synchronous and asynchronous check pointing and recovery-check pointing for distributed database systems-recovery in replicated distributed databases.

UNIT-IV:
Protection and security -preliminaries, the access matrix model and its implementations.-safety in matrix model-advanced models of protection. Data security-cryptography: Model of cryptography, conventional cryptography- modern cryptography, private key cryptography, data encryption standard-public key cryptography-multiple encryption-authentication in distributed systems.

UNIT-V:
Multiprocessor operating systems-basic multi processor system architectures-inter connection networks for multiprocessor systems-caching-hypercube architecture. Multiprocessor Operating System - structures of multiprocessor operating system, operating system design issues- threads-

process synchronization and scheduling. Database Operating systems :Introduction-requirements of a database operating system Concurrency control: theoretical aspects-introduction, database systems-a concurrency control model of database systems- the problem of concurrency control – serializability theory-distributed database systems, concurrency control algorithms-introduction, basic synchronization primitives, lock based algorithms-timestamp based algorithms, optimistic algorithms –concurrency control algorithms, data replication.

TEXTBOOKS:

1. Mukesh Singhal, Niranjan G.Shivaratri,"Advanced concepts in operating systems: Distributed, Database and multiprocessor operating systems", TMH, 2001

REFERENCE Books:

1. AndrewS.Tanenbaum,"Modernoperatingsystem",PHI,2003
2. Pradeep K.Sinha, "Distributed operating system-Concepts and design", PHI,2003.
3. AndrewS.Tanenbaum,"Distributed operating system", Pearson education,2003