

IT8T3B**ADVANCED OPERATING SYSTEMS****Credits:3****Lecture: 3 Periods/week****Internal assessment: 30 marks****Practice/Interaction: 1Period/week****Semester end examination: 70 marks****Objectives:**

- To explain about process synchronization.
- To provide knowledge on distributed operating systems.
- To discuss failure recovery and fault tolerance
- To demonstrate various multi processor operating systems.

Outcomes:

Students will be able to

- Understand process synchronization problems.
- Understand the various concepts of distributed operating systems.
- Gain knowledge on different issues in distributed resource management and architecture algorithms.
- Analyze the techniques of different failure recovery and fault tolerance.
- Understand the structure of multiprocessor operating systems and design issues.

Pre-requisite:

Operating Systems Concepts.

Syllabus:**UNIT -I**

Process Synchronization- Overview, function of an operating system, design approaches ,types of advanced operating systems, synchronization mechanism ,concepts of a process, concrete process, the critical section problem, other synchronization problems-languages mechanism for synchronization- process dead locks, preliminaries, models of deadlocks, models of resources , A graph theoretic model of a system state, necessary and sufficient condition for dead lock

UNIT-II

Distributed operating systems- Introduction-issues in distributed operating systems, communication primitives, inherent limitations, Lamport's logical clock; vector clock; casual ordering; global state; cuts; termination deduction. Distributed mutual exclusion-non token based algorithms- token based algorithms-suziki-kasamsi's broadcast algorithms-distributed deadlock detection-issues in deadlock detection and resolution, centralized deadlock deduction algorithms-distributed dead lock deduction algorithms

UNIT-III

Distributed resource management- Distributed file systems, architecture-mechanisms, design issues, distributed shared memory, architecture-algorithm, protocols design issues. Distributed scheduling, issues, components-algorithms

UNIT-IV

Failure recovery and fault tolerance- Basic concepts, classification of failures-basic approaches to recovery; recovery in concurrent systems; synchronous and asynchronous check pointing and recovery; checking in distributed database systems; fault tolerance-issues-two ,phase and non blocking commit protocols; voting protocols; dynamic voting protocols

UNIT-V

Multi processor and operating systems-Structures of multiprocessor operating systems, design issues, threads, process synchronization-processor scheduling-memory management, reliability/fault tolerance.

Text Book:

4. Mukesh Singhal and N.G. Shivaratri, "Advanced Concepts in Operating Systems", McGraw-Hill, 2000.

Reference Books:

1. Abraham Silberschatz, Peter B. Galvin, G. Gagne, " Operating System Concepts", 8th Edition, Addison Wesley publishing Co.
2. Andrew S. Tanenbaum, " Modern Operating Systems", 2001.

e-LEARNING RESOURCES:

1. <http://www.jntuk-coeerd.in/>
2. <http://stst.elia.pub.ro/news/SO/Modern%20Operating%20System%20-%20Tanenbaum.pdf>