

## 2/4 B.Tech - FIRST SEMESTER

IT3T5

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

- To give an overview on Operating Systems.
- To demonstrate process management and system structure.
- To discuss about the process scheduling and synchronization.
- To explain in detail about memory management and virtual memory.
- To discuss about various concepts in File system.

**Outcomes:**

Students will be able to:

- Understand different structures and services of the operating system.
- Understand the use of scheduling and operations on process.
- Understand the process scheduling algorithms and synchronization concepts.
- Understand the concepts of deadlock and memory management techniques.
- Understand the concepts of virtual memory management techniques and File System.

**Prerequisites:**

C Programming

**Syllabus:****UNIT-I**

Computer System and Operating System Overview: Introduction, Computer System Organization & Architecture, Operating System services, O.S structure, Evaluation of O.S, Special purpose Systems.

**UNIT-II**

System Structure: System Calls

Process Management: Process Concept, Process scheduling, Operations on processes, Interprocess Communication, overview of threads, multi threaded models.

**UNIT-III**

Process Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms

Process Synchronization: Critical Section Problem, Semaphores, Monitors.

**UNIT-IV**

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection & Recovery.

Memory Management: Logical vs. physical address space, Swapping, Contiguous Memory Allocation, Paging, Segmentation.

**UNIT-V**

Virtual Memory Management: Introduction, Demand Paging, Page Replacement & its Algorithms (FIFO, LRU Optimal), Thrashing.

Storage Management

File System: File Concept, Access Methods, Directory & Disk Structure, Allocation methods.

**Text Book:**

1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 8<sup>th</sup> Edition, John Wiley.

**Reference Books:**

1. Operating Systems – Internal and Design Principles Stallings, 6<sup>th</sup> Edition–2005, Pearson education.
2. Tanenbaum A.S., “Operating System Design & Implementation”, Practice Hall NJ.
3. Silbersehatz A. and Peterson J. L., “Operating System Concepts”, Wiley.
4. Dhamdhere: Operating System TMH
5. Stalling, William, “Operating Systems”, Maxwell McMillan International Editions.
6. Dietel H. N., “An Introduction to Operating Systems”, Addison Wesley.

**e-Learning Resources:**

1. <http://nptel.ac.in/downloads/106108101/>
2. [http://www.youtube.com/watch?v=MaA0vFKt-ew&list=PL88oxl15Wi4Kw1aEY2bC5l\\_4pouojtd4](http://www.youtube.com/watch?v=MaA0vFKt-ew&list=PL88oxl15Wi4Kw1aEY2bC5l_4pouojtd4)
3. <http://www.jntuk-coeerd.in/>
4. [http://iit.qau.edu.pk/books/OS\\_8th\\_Edition.pdf](http://iit.qau.edu.pk/books/OS_8th_Edition.pdf)