

## Operating Systems

### Course Objectives:

To gain knowledge about the Operating Systems concepts such as process, main memory management, secondary memory management, CPU and disk scheduling etc

### Course Outcomes:

By the end of the course student will be able to

- describe the general architecture of computers
- describe, contrast and compare differing structures for operating Systems
- understand and analyse theory and implementation of: processes, resource control (concurrency etc.), physical and virtual memory, scheduling, I/O and files

### Syllabus:

#### UNIT-I:

**Computer System and Operating System Overview:** Overview of computer operating systems, operating systems functions, protection and security, distributed systems, special purpose systems, operating systems structures and systems calls, operating systems generation.

#### UNIT-II:

**Process Management** – Process concept- process scheduling, operations, Inter process communication. Multi Thread programming models. Process scheduling criteria and algorithms, and their evaluation.

#### UNIT-III:

**Concurrency:** Process synchronization, the critical- section problem, Peterson's Solution, synchronization Hardware, semaphores, classic problems of synchronization, monitors, Synchronization examples

#### UNIT-IV:

**Memory Management:** Swapping, contiguous memory allocation, paging, structure of the page table, segmentation

#### **Virtual Memory Management:**

virtual memory, demand paging, page-Replacement, algorithms, Allocation of Frames, Thrashing

#### UNIT-V:

**Principles of deadlock** – system model, deadlock characterization, deadlock prevention, detection and avoidance, recovery from deadlock,

#### UNIT-VI:

**File system Interface-** the concept of a file, Access Methods, Directory structure, File system mounting, file sharing, protection.

**File System implementation-** File system structure, allocation methods, free-space management

**Mass-storage structure** overview of Mass-storage structure, Disk structure, disk attachment, disk scheduling

### TEXT BOOKS:

1. Operating System Concepts- Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7<sup>th</sup> Edition, John Wiley.
2. Operating Systems? – Internal and Design Principles Stallings, Sixth Edition–2005, Pearson education

### REFERENCE BOOKS:

1. [http://nptel.iitm.ac.in/courses/Webcourse-contents/IISc-BANG/ Operating%20Systems/New\\_index1.html](http://nptel.iitm.ac.in/courses/Webcourse-contents/IISc-BANG/ Operating%20Systems/New_index1.html)
2. Operating systems- A Concept based Approach-D.M.Dhamdhare, 2<sup>nd</sup> Edition, TMH
3. Operating System A Design Approach-Crowley, TMH.
4. Modern Operating Systems, Andrew S Tanenbaum 3<sup>rd</sup> edition PHI.