Educate Elevate Enlighten

JSS Mahavidyapeetha

JSS Science And Technology University

(Established Under 355 Science and Technology University Act No. 43 of 2013) (Formerly Known as SJCE)

JSS

SCIENCE AND TECHNOLOGY UNIVERSITY

MYSURU

Department: Computer Science and ***Engineering***

Course Title: Operating Systems

*Credits(**L:T:P): 4:0**:0*

Type of Course : Lecture

*CIE Marks: **50***

Course Code: CS450

Core/Elective **: Core *Total Contact Hours: 52 SEE Marks: 100***

Pre-**Requisites:** Computer Organization and Architecture, Data Structures.

Course Outcomes: After completing this course, students should be able to:

CO1: Understand various activities of process, thread, memory, file and secondary storage components of an Operating System.

CO2:

CO3:

C04:

Apply various scheduling algorithm of process, memory and secondary storage components.

Analyze the concepts of **inter** process communication, deadlocks, memory allocation strategies, page replacement algorithms of OS.

Evaluate various algorithms for handling processes, threads, memory allocation strategies and deadlocks.

Unit No.	**Course Content**	**No.** of **Hours**

2

3
1

Introduction to Operating **Systems and System structures:**

What operating systems do; Computer System organization; Computer System architecture; Operating System structure; OS operations; Process management; Memory management; Storage management; Protection and security; Distributed system; Special-purpose systems; Computing environments, services

System structure: User - Operating System interface; System calls and its types System programs; OS design and implementation; OS structure; Virtual machines; OS generation; System boot.

Process **Management and Synchronization:**

Process concept; Process scheduling; Operations on processes; Inter-process communication. Multi-Threaded Programming: Overview; Multithreading models; Thread Libraries; Threading issues. Process Scheduling: Basic concepts; Scheduling criteria; Scheduling algorithms; Multiple-Processor scheduling; Thread scheduling.

Synchronization: The Critical section problem; Peterson's solution; Synchronization hardware; Semaphores; Classical problems synchronization; Monitors.

Deadlocks and Memory Management:

of

Deadlocks: System model; Deadlock characterization; Methods for handling deadlocks; Deadlock prevention; Deadlock avoidance; Deadlock detection and recovery from deadlock.

Memory Management Strategies: Background; Swapping; Contiguous

10

12

12

memory allocation; Paging; Structure of page table; Segmentation. Virtual Memory Management: Background; Demand paging; Copy-on-write; Page replacement; Allocation of frames; Thrashing.

File System:

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File System: File concept; Access methods; Directory structure; File system mounting; File sharing; Protection. Implementing File System: File system structure; File system implementation; Directory implementation; Allocation methods; Free space management,

Secondary Storage Structures and Protection:

Secondary storage Structure: Mass storage structures; Disk structure; Disk attachment; Disk scheduling; Disk management

Protection: Goals of protection, Principles of protection, Domain of protection, Access matrix, Implementation of access matrix, Access control, Revocation of access rights

08

10

Text Books:

1. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne: Operating System Principles, 9th Edition, Wiley India, 2013

Reference Books:

1. D.M Dhamdhere: Operating systems - A concept **based** Approach, 4th Edition,
Tata McGraw-Hill, 2013.

2. P.C.P. Bhatt: Introduction to **Operating** Systems: Concepts and **Practice**, 4th
Edition, PHI, 2014.

3. Harvey M Deital: Operating systems, 3rd Edition, Pearson Education,2007

Web Resources:

1. https://www.youtube.com/playlist?list=PLLDC70psjvq5hIT0kfr1 sirNuees0NIbG 2. https://youtu.be/783KAB-tuE4 - NPTEL IIT, Madras
3. https://youtu.be/a819f7r4r_c - NPTEL IIT, Madras
4. https://www.youtube.com/playlist?list=PLsylUO6W5M3CAGT6OdubyH6FztKfJ CCFB
5. https://nptel.ac.in/courses/106108101/
6. https://youtu.be/2i2N_Qo_FyM