NIRMA UNIVERSITY

Institute of Technology

B. Tech Computer Science and Engineering

Semester IV

L	T	P	C
3	0	2	4

Course Code	2CS403
Course Title	Operating Systems

Course Learning Outcomes (CLO):

At the end of the course, students will be able to -

1. illustrate basic components of operating systems
2. comprehend the mechanism of operating Systems to handle processes, memory and file management
3. demonstrate competence in recognizing and using operating system features

Syllabus: **Teaching Hours:**

Unit I   3

Overview of Computer System and Operating System: Elements of computer system, operating system objectives and functions, evolution of operating systems

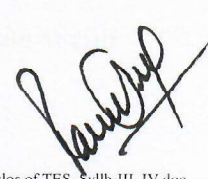### Unit II   18

Process Description and Control: Process states, process description, process control, process management, Uniprocessor scheduling, multiprocessor and real-time scheduling, case study

Unit III   3

Threads: Processes And Threads, Symmetric Multiprocessing, Micro kernels

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Unit IV   **8**

Concurrency: Mutual exclusion and synchronization, deadlock and starvation, case study

Unit V   **10**

Memory Management and Virtual Memory: Memory management requirements, partitioning, paging, segmentation, virtual memory, case study

Unit VI   **3**

I/O Management and Files: I/O devices, organization of I/O functions, OS design issues, I/O buffering, disk scheduling, disk cache , file management, security aspects in OS, case study

Self-Study:

The self-study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self-study contents.

Laboratory Work:

Laboratory work will be based on above syllabus with minimum 10 experiments to be incorporated.

Suggested Readings^:

1. William Stallings, Operating Systems, PHI.

2. Silberschiltz, Galvin and Greg Gange, Operating System, Willey India.

3. Sumitabha Das, Unix Concepts and Applications, TMH Publications.

4. Yashvant Kanetkar, Shell Programming, BPB.

5. A.S.Tannenbaum, Modern Operating Systems, TMH Publications.

6. Kernighan, the UNIX Programming Environment, Pearson

7. Maurice Bach, The Unix Operating System, Prentice Hall

L = Lecture, T = Tutorial, P = Practical, C = Credit

^ this is not an exhaustive list