

**NIRMA UNIVERSITY**  
**SCHOOL OF TECHNOLOGY, INSTITUTE OF TECHNOLOGY**  
**Proposed Teaching & Examination Scheme**  
**Master of Computer Application (2- years programme)**  
**Semester-I**

L	T	P	C
3	0	2	4

<b>Course Code</b>	<b>3MCA103</b>
<b>Course Title</b>	<b>Operating System</b>

**Course Outcomes (COs):**

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
4. understand the mechanism of Operating systems to handle Input Output management

**Syllabus:**

**Teaching hours:**

<b>Unit I</b> <b>Overview of Computer System and Operating System:</b> Basic computer organization and design, operating system objectives and functions, evolution of operating systems.	<b>3</b>
<b>Unit II</b> <b>Process Description and Control:</b> Process states, process description, process control, process management, Uniprocessor scheduling, case study.	<b>18</b>
<b>Unit III</b> <b>Threads:</b> Processes And Threads, Symmetric Multiprocessing, Micro kernels.	<b>3</b>
<b>Unit IV</b> <b>Concurrency:</b> Mutual exclusion and synchronization, deadlock and starvation, case study.	<b>8</b>
<b>Unit V</b> <b>Memory Management and Virtual Memory:</b> Memory management requirements, partitioning, paging, segmentation, virtual memory, case study.	<b>10</b>
<b>Unit VI</b> <b>I/O Management and Files:</b> 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.	<b>3</b>

**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 Linux Shell Scripts, system calls, toy Operating System and other practicals based on above syllabus with minimum 8 experiments to be incorporated that will be considered for evaluation.

**Suggested Readings<sup>^</sup>:**

1. William Stallings, Operating Systems, PHI.
2. A.S.Tannenbaum, Modern Operating Systems, TMH Publications.
3. Unix Concepts and Applications, Sumitabha Das, TMH Publications.
4. Yashvant Kanetkar, Shell Programming, BPB.
5. Silberschiltz, Galvin and Greg Gange, Operating System, Willey India.
6. Kernighan, the UNIX Programming Environment, Pearson.

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

<sup>^</sup>this is not an exhaustive list

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