



**Operating System
Operating System
[CORE COURSE]**

Semester: IV	Credits: 3	Subject Code: BC42103	Lectures: 48
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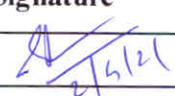
Course Outcomes:

At the end of this course ,the learner will be able to,

- Identify the services provided by Operating System
- Recognize the scheduling concept
- Discuss design issues related to memory management and various related algorithms.
- Discuss design issues related to File management and various related algorithms

Unit 1: Introduction to Operating System and Structure	5
<ul style="list-style-type: none"> • What is operating system • Computer system architecture • Services provided by OS • Types of OS • Operating System Structure -- Simple structure -Layered approach -Micro kernels -Modules • Virtual Machines – Introduction, Benefits • User operating system Interface • System Calls--Process or job control -Device Management - File Management • System Program <ul style="list-style-type: none"> • Operating System Structure 	

Unit 2: Process Management and CPU Scheduling	18
<ul style="list-style-type: none"> • Process Management: • The process - Process states - Process control block • Process Scheduling • Scheduling queues - Schedulers -Context Switch • Operation on Process – • Process Creation -Process Termination • Interprocess Communication – • Shared memory system - Message passing systems. • Critical section problem • Semaphores -- Concept - Implementation – • Types of Semaphores • Classical Problems of synchronization --Bounded buffer problem - Readers & writers problem - Dining Philosophers problem • CPU Scheduling 	

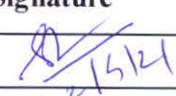
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<ul style="list-style-type: none"> • Scheduling Concepts -- CPU-I/O Burst Cycle – • CPU Scheduler -Preemptive and Non-preemptive scheduling - Dispatcher • Scheduling criteria • Scheduling Algorithms -- FCFS - SJF (Preemptive& non-preemptive) - Priority Scheduling (Preemptive& Non- preemptive) - Round Robin Scheduling - Multilevel Queues - Multilevel Feedback queues 	
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Unit 3: Deadlock and Memory Management	20
<ul style="list-style-type: none"> • Deadlock Characterization • Necessary Condition • Deadlock Handling Technique-- • Deadlock Prevention • Deadlock Avoidance – • Safe State - Resource allocation graph algorithm - Bankers algorithm - Deadlock Detection • Recovery from Deadlock -- -Process Termination -Resource Preemption • Introduction to Memory Management <ul style="list-style-type: none"> ○ Background -- -Basic hardware - Address binding - Logical versus physical address space - Dynamic loading - Dynamic linking and shared libraries ○ Swapping ○ Contiguous Memory Allocation – ○ Memory mapping and protection ○ Memory allocation ○ Fragmentation ○ Paging ○ Segmentation ○ Virtual Memory Management ○ Demand paging - Performance of demand paging ○ Page replacement -- - FIFO - OPT - LRU 	

Unit 4: File System and I/O system	07
<ul style="list-style-type: none"> • Introduction & File concepts (file attributes, Operations on files) • Access methods -- Sequential access - Direct access • File structure -- - Allocation methods - Contiguous allocation - Linked Allocation - Indexed Allocation • Free Space Management -- - Bit Vector - Linked List – Grouping • Introduction • I/O Hardware • Application of I/O Interface • Kernel I/O Subsystem 	

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- Disk Scheduling -- FCFS - Shortest Seek time first - SCAN - C- SCAN

#12 hours for Library work, assignments practical or field work

Recommended Text Books:

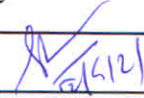
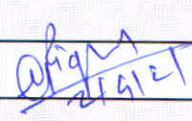
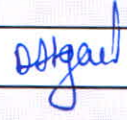
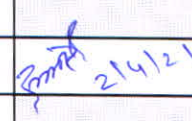
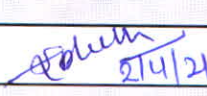
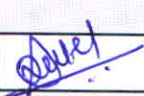

- Milan Milenkovic, *Operating Systems*, Tata McGraw Hill Edition, 2007.

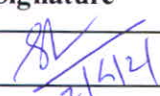
Reference Books:

- Sibebrchatz, Galvin, Gagne, *Operating System Concepts*, (8th Edition).
- Pabitra Pal Choudhary, *Operating Systems: Principles and Design*, (PHI Learning Private Limited)

Websites:

- <https://www.tutorialspoint.com/>

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Subject Expert (Outside SPPU)	Prof Sachin Bohite	 21/4/21
VC Nominee	Prof Anjum Patel	
Industry Expert	Ms Shrutika Wayal	 21/4/21
One Alumni***	Ms. Vidhi Thakkar	

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