



ARSD College, University of Delhi

Model Course Handout/Lesson Plan

Course Name : B.Sc. (Hons.) Computer Science						
Semester	Course Code	Course Title	Lecture (L)	Tutorial (T)	Practical (P)	Credit (C)
III	BHCS06	Operating system Discipline Specific Core Course - (DSC)	4			4
Teacher/Instructor(s)		Dr. Parul Jain				
Session		2022-23				

Course Objective:

The course introduces the students to different types of operating systems. Operating system modules such as memory management, process management and file management are covered in detail.

Course Learning Outcomes:

1. Implement multiprogramming, multithreading concepts for a small operating system.
2. Create, delete, and synchronize processes for a small operating system.
3. Implement simple memory management techniques.
4. Implement CPU and disk scheduling algorithms.
5. Use services of modern operating system efficiently
6. Implement a basic file system.

Lesson Plan:

Week	Lecture No.	Topics to be covered
1	1-4	Operating System, Definition and its purpose, Time sharing, Multiprogramming and Multiprocessing, Operating System Operations
2	5-8	Operating System Services, User and Operating System Interface, System Calls and its Types.
3	9-12	Operating system Design and Structure, System Programs, System Boot, Process
4	13-16	Operations on Processes, Inter process communication, Shared memory.
5	17-20	Multithreading Models, Multicore Programming, Thread Libraries
6	21-24	Process Scheduling criteria, Process Scheduling Algorithms, Multiple Processor Scheduling.
7	25-28	Process Synchronization, Critical Section Problem, Semaphores.
8	29-32	Deadlock Characterization, Methods for handling deadlocks.
9-10	33-40	Memory Allocation Strategies-Fixed and Variable partition, Swapping, Logical

		and Physical Address Space, Paging, Structure of Page Table and its Variations, Shared pages, Segmentation
11-12	41-48	Virtual memory, Page Replacement Algorithms, Allocation of frames, Thrashing, Working set model.
13-14	49-56	File System, File Characteristics, Access methods, Directory and Disk structure, File system structure and implementation, Directory implementation, Free space Implementation, File Allocation methods.
15	57-60	Overview of Secondary Devices, Disk Scheduling Algorithms

Evaluation Scheme:

No.	Component	Duration	Marks
1.	Internal Assessment		25
	• Quiz		
	• Class Test		
	• Attendance		
	• Assignment		
2.	End Semester Examination	3 hr	75

Details of the Course		
Unit	Contents	Contact Hours
I	Introduction: Operating systems (OS) definition, Multiprogramming and Time Sharing operating systems, real time OS, Multiprocessor operating systems, Multicore operating systems, Various computing environments.	4
II	Operating System Structures: Operating Systems services, System calls and System programs, operating system architecture (Micro Kernel, client server) operating	8
III	Process Management: Process concept, Operation on processes, Multi-threaded processes and models, Multicore systems, Process scheduling algorithms, Process synchronization. The Critical-section problem and deadlock characterization, deadlock handling.	20
IV	Memory Management: Physical and Logical address space; Memory allocation strategies - Fixed and Variable Partitions, Paging, Segmentation, Demand Paging and virtual memory, Page Replacement algorithm.	16
V	File and I/O Management: Directory structure, File access methods, Disk scheduling algorithms.	12
	Total	60
Suggested Books:		
Sl. No.	Name of Authors/Books/Publishers	Year of Publication/Reprint

1.	Silberschatz, A., Galvin, P. B., & Gagne, G. (2018). Operating Systems Concepts. 10th edition..	2018
2.	Dhamdhere, D. M. (2006). Operating Systems: A Concept-based Approach. 2nd edition. Tata McGraw-Hill Education.	2006
3.	Kernighan, B. W., & Rob Pike, R. (1984). The Unix programming environment (Vol. 270). Englewood Cliffs, NJ: Prentice-Hall	1984
4.	Stallings, W. (2018). Operating Systems: Internals and Design Principles. 9th edition. Pearson Education.	2018
5.	Tanenbaum, A. S. (2007). Modern Operating Systems. 3rd edition. Pearson Education.	2007
Mode of Evaluation:		Internal Assessment / End Semester Exam

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