

BCA - 3rd Semester

Course: 030010312- CC9 Fundamentals of Operating System

LESSON PLAN

Objective: To provide a comprehensive knowledge of Operating System, its services and determine the concept of process, memory and device management.

Course Outcomes: Upon the completion of the course students shall be able to:

- CO1: Describe Operating System concepts, services and structure.
- CO2: Illustrate process concept, process operations and process scheduling algorithms.
- CO3: Identify deadlock and its prevention and avoidance.
- CO4: Determine the concept of memory management, swapping, paging, segmentation, virtual memory management and page replacement algorithms.
- CO5: Classify file system concepts, Sharing and protection.
- CO6: Classify disk structure and disk scheduling algorithms.

Unit	Sub Unit	No. of Lecture(s)	Topics	Reference Chapter/Additional Reading	Teaching Methodology	Evaluation Parameters
Unit 1. Introduction						
	1.1	2	Operating System Concepts	(SZ)#1-Page No.3-6	Chalk & Talk Presentation	
	1.2	1	Classification of Operating Systems	(RK)#1-Page No.9-12	Chalk & Talk Presentation	
	1.3	2	Operating System Structure	(SZ)#1-Page No.18-20	Chalk & Talk	
	1.4	1	Operating System Services	(SZ)#2 -Page No.49-52	Presentation	
Unit 2. Process and Process Management						
	2.1	2	Process Concepts	(SZ)#3-Page No.101-105	Chalk &Talk & Presentation	Quiz
	2.2	2	Process Scheduling	(SZ)#3-Page No.105-110	Chalk &Talk & Presentation	
	2.3	2	Operations On Processes	(SZ)#3-Page No.110-116	Chalk &Talk & Presentation	
	2.4	4	Scheduling Algorithms: First-Come, First-Served Scheduling, Shortest-Job-First Scheduling, Priority Scheduling and Round-Robin Scheduling	(SZ)#5-Page No.188-196	Chalk &Talk, Open book study Audio-Visual Tool	
Unit 3. Deadlocks						
	3.1	1	Resource Utilization	(SZ)#7-Page No.283-285	Chalk &Talk & Presentation	

	3.2	2	Necessary Conditions For Deadlock Characterization: Mutual Exclusion, Hold and Wait, No Pre-emption, Circular Wait	(SZ)#7-Page No.285-287	Chalk &Talk, Open book study Audio-Visual Tool	
	3.3	2	Deadlock Prevention: Mutual Exclusion, Hold and Wait, No Pre-emption, Circular Wait	(SZ)#7-Page No.291-294	Group Discussion ,Chalk &Talk & Presentation	
	3.4	3	Deadlock Avoidance: Resource-Allocation-Graph and Banker's Algorithm	(SZ)#7-Page No.294-298	Chalk &Talk, Open book study Audio-Visual Tool	
Unit 4. Memory Management						
	4.1	1	Memory Management: Introduction	(SZ)#8-Page No.315-322	Self-Study Open book study	Mid Term Exam
	4.2	1	Swapping	(SZ)#8-Page No.322-324	Chalk & Talk Presentation & Audio-Visual Tool	
	4.3	1	Contiguous Memory Allocation	(SZ)#8-Page No.324-328	Chalk & Talk Presentation	
	4.4	2	Paging	(SZ)#8-Page No.328-337	Chalk & Talk Presentation	
	4.5	2	Segmentation	(SZ)#8-Page No.342-345	Chalk & Talk Presentation	
Unit 5. Virtual Memory Management						
	5.1	2	Virtual Memory Management: Introduction	(SZ)#9-Page No.357-360	Chalk & Talk Presentation	
	5.2	1	Demand Paging	(SZ)#9-Page No.361-367	Chalk & Talk Presentation	
	5.3	4	Page Replacement Algorithms: Basic Page Replacement ,FIFO Page Replacement, Optimal Page Replacement, Least Recently Used Page Replacement	(SZ)#9-Page No.369-377	Chalk & Talk Presentation & Audio-Visual Tool	
Unit 6. File and Device Management						
	6.1	1	File Concepts	(SZ)#10-Page No.421-430	Chalk &Talk & Presentation	Presen tation & Interna l Exami nation
	6.2	1	Access Methods	(SZ)#10-Page No.430-433	Chalk &Talk & Presentation	
	6.3	1	Directory and Disk Structure	(SZ)#10-Page No.433-444	Chalk &Talk & Presentation	
	6.4	2	File Sharing and Protection	(SZ)#10-Page No446.-456	Presentation	

6.5	1	Device driver : Basic and Types	https://www.techwalla.com/articles/types-of-device-drivers	Open book Study
6.5	4	Disk Structure, Disk Scheduling: First-Come, First-Served Scheduling, Shortest-serve-time-first Scheduling, SCAN Scheduling, C-SCAN Scheduling and LOOK Scheduling.	(SZ)#12-Page No.510-516	Chalk & Talk Presentation & Audio-Visual Tool

Text Book:

1. Silberschatz A., Galvin P. and Gagne G. Operating System Principles, Wiley (SZ).

Reference Books:

1. Pramod Chandra P. Bhatt, An introduction to Operating Systems Concepts and Practice, PHI.
2. Stallings W, Operating Systems: Internals and Design Principles, Pearson.
3. Tanenbaum A, Modern Operating Systems, PHI.
4. Rohit Khurana, Operating System, Vikas(RK).

Course Units and Course Outcomes Mapping:

	Unit	Course outcome					
		CO1	CO2	CO3	CO4	CO5	CO6
1	Introduction	✓					
2	Process and Process Management	✓	✓				
3	Deadlocks	✓		✓			
4	Memory Management	✓			✓		
5	Virtual Memory Management	✓			✓		
6	File and Device Management	✓				✓	✓

Course Outcomes and Program Outcome Mapping:

Program Outcome:

- PO1: Ability to understand the concepts of key areas in computer science.
 PO2: Ability to design and develop system, component or process as well as test and maintain it so as to provide promising solutions to industry and society.
 PO3: Effective communication and presentation skill.
 PO4: Ability to understand professional and ethical responsibility.
 PO5: Recognition of the need for life-long learning.

Course Outcomes	Program outcome				
	P01	P02	P03	P04	P05
C01	✓	✓			✓
C02				✓	
C03	✓				
C04			✓	✓	
C05		✓			
C06		✓			

Modes of Transaction (Delivery):

Unit No	Topic Detail	Teaching Approach	PO mapped
2	Identify Process and process management	Relate process state with real time examples	PO1,P05
3	Basics of deadlock and it's conditions	Live Example for deadlock Use various objects like (book, pen etc...) and give live demonstration of deadlock in the classroom.	PO1,P03,P05
-	Reading of Technical News	Student will read the technical news from Google Technical news or IndiaTimes for first 5 minutes during lecture.	PO3, P05

Activities/Practicum:

The following activities shall be carried out by the students:

1. Historical study of the operating systems.
2. Difference between various operating system.
3. Comparison of other system software with operating system.

The following activities shall be carried out by the teacher:

Learner	Activities to be done	PO mapped
For slow learners	Assign them question as per topic on daily basis and provide sufficient time to write the answers in next lecture. If students are not attempting answers then they have to write doubled of that day task and need to show on next day.	P01,P02
For advanced learners	Demonstration of partition scheme in Windows and Ubuntu OS	P01, P02, P03
For all	Questions shall be given to the students in the beginning to understand the basic concepts. Students answer will be evaluated by faculty member and if student has not attempted answer than they have to write 5 times and need to show to the faculties.	P01

Concept linkage:

Unit/Sub-Unit	Prior concept linkage	Post concept linkage
4.1, 5.1	030010111: Unit 4: 4.2, 4.5, 4.7	-
2.1	030010111: Unit 5: 5.2	-