Program : **Diploma in Computer Engineering / Computer Hardware Engineering / Cloud Computing and BigData / Cyber Forensics and Information Security / Communication and Computer Networking**	
Course Code : **5132**	Course Title: **Operating System**
Semester : **5 / 5 / 3 / 3 / 3**	Credits: **4**
Course Category: **Program Core**	
Periods per week: **4 (L:4 T:0 P:0)**	Periods per semester: **60**

Course Objectives:

- Recognize the basic operating system concepts.
- Provide a comprehensive introduction to process management, memory management, I/O management,

Course Prerequisites:

Topic	Course code	Course name	Semester
Basics of operating systems.		Introduction to IT systems Lab	I
Computer functions, memory and I/O devices		Computer organisation	III

Course Outcomes :

On completion of the course, the student will be able to:

COn	Description	Duration (Hours)	Cognitive Level
CO1	Outline the significance of operating systems and its functions.	10	Understanding
CO2	Explain process and process management.	16	Understanding
CO3	Illustrate memory management schemes.	20	Understanding
CO4	Explain file organization and disk scheduling algorithms	12	Understanding
	Series Test	2	

CO – PO Mapping

Course Outcomes	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7
CO1	2						
CO2	2						
CO3	2						
CO4	2						

3-Strongly mapped, 2-Moderately mapped, 1-Weakly mapped

Course Outline

Module Outcomes	Description	Duration (Hours)	Cognitive Level
CO1	**Outline the significance of operating systems and its functions**		
M1.01	Explain software, system software and application software.	1	Understanding.
M1.02	Explain System software-assembler, compiler, interpreter and operating system with examples	3	Understanding.
M1.03	Explain the functions of Operating System	3	Understanding.
M1.04	Summarise different types of operating system	3	Understanding.
Contents: Introduction to software: System software & application software, examples-System software – assembler, loader, compilers, interpreters and their functions, comparison. Operating system – definition – functions of Operating system - different types of Operating Systems - batch systems - multiprogramming systems - time sharing - multiprocessor systems - real time systems.			
CO2	**Describe process & process management**		
M2.01	Illustrate process control block with its structure	2	Understanding
M2.02	Explain various states of a process with state diagram	2	Understanding
M2.03	Classify CPU schedulers and Illustrate scheduling algorithms	6	Understanding
M2.04	Show resource allocation graph	2	Understanding
M2.05	Demonstrate deadlock and its causes	2	Understanding

M2.06	Explain Process synchronization	2	Understanding
	Series Test – I	1	

Contents:

Define process - process control block (PCB) and its general structure - different states of a process with the help of state diagram.- Schedulers – long, medium and short term- difference between preemptive and non-preemptive scheduling- Various scheduling criteria - FCFS, SJF, Priority, and RR scheduling algorithms with Gantt charts –comparison of various scheduling algorithms-Resource allocation graph-deadlock-its causes-Process synchronization and critical section management.

CO3	**Illustrate memory management schemes.**		
M3.01	Define memory management.	1	Remembering
M3.02	Show various address binding schemes	3	Understanding
M3.03	Explain memory management techniques	5	Understanding
M3.04	Illustrate memory allocation strategies.	5	Understanding
M3.05	Demonstrate page replacement algorithms.	6	Understanding

Contents:

Memory management - Different address bindings – compile, link and run time bindings. - Difference between logical address and physical address - Contiguous memory allocation – fixed partition and variable partition – Allocation Strategies - first fit, best fit and worst fit - Define fragmentation – internal and external, and solutions - Paging and paging hardware - Segmentation, advantages of segmentation over paging- Concept of virtual memory - Demand paging - Page-faults and how to handle page faults. - Page replacement algorithms: FIFO, optimal, LRU -Thrashing.

CO4	**Explain file organization and disk scheduling algorithms**		
M4.01	Define the concept of file system & file operations	2	Remembering
M4.02	Explain different file organizations	2	Understanding
M4.03	Classify directory structures	2	Understanding
M4.04	Illustrate file allocation methods	3	Understanding
M4.05	Explain disk scheduling algorithms.	3	Understanding
	Series Test – II	1	

Contents:

File system - Concept of file and directory - Various file operations - File organization concepts – sequential and indexed. Different directory structures – single level, two-level, and tree structured directories. - Different allocation methods – contiguous, linked and

indexed allocations. Various disk scheduling algorithms-FCFS, SSTF, Scan, C-Scan, Look & C-Look.

Text / Reference

T/R	Book Title/Author
T1	Abraham Silberschatz, Peter Gaer Galvin and Greg Gagne, **Operating System Concepts**, Wiley Publications-Eighth Edition
R1	William Stallings, **Operating Systems-Internals and Design Principles**, PEARSON Publications- Seventh Edition
R2	Andrew S Tanenbaum, Herbert Bos, **Modern Operating Systems**, Pearson, 4/e,

Online Resources

Sl.No	Website Link
1	https://nptel.ac.in/courses/106/105/106105214/#
2	https://www.tutorialspoint.com/operating_system/index.htm