DHANALAKSHMI SRINIVASAN ENGINEERING COLLEGE
(AUTONOMOUS)
(Approved by AICTE & Affiliated to Anna University, Chennai)
Re-Accredited by NAAC with 'A' Grade
Accredited by NBA for AERO, BME, CSE, ECE, EEE, IT & MECH.
PERAMBALUR-621212, TAMILNADU, INDIA.
Website: www.dsengg.ac.in

LABORATORY COURSE PLAN

LAB COURSE TITLE	OPERATING SYSTEM LABORATORY			
LAB COURSE CODE	U23ITP41			
LAB COURSE STRUCTURE	LECTURE	TUTORIAL	PRACTICAL	CREDIT
	0	0	4	2
REGULATION	BRANCH	YEAR/ SEC	SEMESTER	ACADEMIC YEAR
2023	IT	II/B, C	IV	2024-2025
COURSE INCHARGE				

SYLLABUS

COURSE OBJECTIVE:

- To learn Unix commands and shell programming
- To implement various CPU Scheduling Algorithms
- To implement Process Creation and Inter Process Communication.
- To implement Deadlock Avoidance and Deadlock Detection Algorithms
- To implement Page Replacement Algorithms
- To implement File Organization and File Allocation Strategies

LIST OF EXPERIMENTS

1. Basics of UNIX commands
2. Write programs using the following system calls of UNIX operating system fork, exec, getpid, exit, wait, close, stat, opendir, readdir
3. Write C programs to simulate UNIX commands like cp, ls, grep, etc.
4. Shell Programming
5. Write C programs to implement the various CPU Scheduling Algorithms
6. Implementation of Semaphores
7. Implementation of Shared memory and IPC
8. Bankers Algorithm for Deadlock Avoidance
9. Implementation of Deadlock Detection Algorithm
10. Write C program to implement Threading & Synchronization Applications
11. Implementation of the following Memory Allocation Methods for fixed partition
    a) First Fit b) Worst Fit c) Best Fit
12. Implementation of Paging Technique of Memory Management

13. Implementation of the following Page Replacement Algorithms
a) FIFO b) LRU c) LFU
14. Implementation of the various File Organization Techniques
15. Implementation of the following File Allocation Strategies
a) Sequential b) Indexed c) Linked

TOTAL: 60 PERIODS

BIBLIOGRAPHY

TEXT/REFERENCE

BOOKS:

- Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating SystemConcepts", 9th Edition, John Wiley and Sons Inc.
- Operating System Concepts, 10th Edition Abraham Silberschatz, Greg Gagne, Peter B.Galvin. April 2018.
- Ramaz Elmasri, A. Gil Carrick, David Levine, "Operating Systems – A Spiral Approach", Tata McGraw Hill Edition, 2010.
- Achyut S.Godbole, Atul Kahate, "Operating Systems", Mc Graw Hill Education, 2016.
- Gary Nutt, "Operating Systems", Third Edition, Pearson Education, 2004.

HARDWARE:

Standalone desktop

SOFTWARE:

- Linux Server (or) Turbo C Compiler

web link for resource &Virtual lab reference link

https://www.vsbec.com/wp-content/uploads/2019/02/OS-LAB.pdf
http://cseannauniv.blogspot.com/2019/04/cs8461-operating-systems-lab-r2017-ii.html

EXP. NO.	NAME OF THE EXPERIMENTS	NO. OF PERIODS	CUMULATIVE PERIODS
1.	Basics of UNIX commands	4	4
2.	System calls of UNIX operating system	4	8
3.	Simulate UNIX commands	4	12
4.	Shell Programming	4	16
5.	CPU Scheduling Algorithms	4	20
6.	Semaphores	4	24
7.	Shared memory and IPC	4	28
8.	Bankers Algorithm	4	32
9.	Deadlock Detection Algorithm	4	36
10.	Threading & Synchronization Applications	4	40
11.	Memory Allocation Methods	4	44
12.	Paging	4	48
13.	Page Replacement Algorithms	4	52
14.	File Organization Techniques	4	56
15.	File Allocation Strategies	4	60

COURSE OUTCOME:

Upon Completion of the course, the students will be able to:

CO1: Compare the performance of various CPU Scheduling Algorithms.
CO2: Learn the Deadlock avoidance and Detection Algorithms.
CO3: Understand Semaphores Algorithm.
CO4: Illustrate the processes and implement IPC.
CO5: Understand the performance of the various Page Replacement Algorithms.
CO6: Explain the File Organization and File Allocation Strategies.

CO-PO mapping:

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2		
CO1	3	2	2	2	2	-	-	-	-	-	2	-	2	1		
CO2	3	2	2	2	1	-	-	-	-	-	2	-	2	1		
CO3	2	2	2	2	1	-	-	-	-	-	1	1	1	1		
CO4	3	2	2	2	2	-	-	-	-	-	2	1	2	1		
CO5	2	2	2	1	2	-	-	-	-	-	2	1	1	1		
CO6	3	2	2	2	2	-	-	-	-	-	2	1	2	2		
AVG	2.67	2	2	1.83	1.67	-	-	-	-	-	1.83	1	1.67	1.17		

EXP. NO.	NAME OF THE EXPERIMENTS	Identified Resource link
1	Basics of UNIX commands	https://www.studocu.com/in/document/anna-university/os-lab/operating-systems-lab-manual/15310000
2	System calls of UNIX operating system	https://www.vsbec.com/wp-content/uploads/2019/02/OS-LAB.pdf
3	Simulate UNIX commands	https://www.slideshare.net/SelviS7/cs8461-os-labmanualsselvi
4	Shell Programming	https://www.slideshare.net/SelviS7/cs8461-os-labmanualsselvi
5	CPU Scheduling Algorithms	https://www.iare.ac.in/sites/default/files/lab2/OS%20LAB%20MANUAL_0.pdf
6	Semaphores	http://www.vidyarthiplus.in/2012/01/anna-university-operating-system-os-lab.html
7	Shared memory and IPC	http://www.pmctech.org/wp-content/uploads/2019/12/NAAC/EP/CO/2017/CS8461.pdf
8	Bankers Algorithm	https://pdfcoffee.com/cs8461-os-lab-manual-print-converteddocx-pdf-free.html
9	Deadlock Detection Algorithm	http://www.pmctech.org/wp-content/uploads/2019/12/NAAC/EP/CO/2017/CS8461.pdf
10	Threading & Synchronization Applications	https://www.studocu.com/in/document/anna-university/os-lab/operating-systems-lab-manual/15310000
11	Memory Allocation Methods	https://pdfcoffee.com/cs8461-os-lab-manual-print-converteddocx-pdf-free.html
12	Paging	http://www.pmctech.org/wp-Content/uploads/2019/12/NAAC/EP/CO/2017/CS8461.pdf

13	Page Replacement Algorithms	http://www.vidyarthiplus.in/2012/01/anna-university-operating-system-os-lab.html
14	File Organization Techniques	http://www.vidyarthiplus.in/2012/01/anna-university-operating-system-os-lab.html
15	File Allocation Strategies	http://www.vidyarthiplus.in/2012/01/anna-university-operating-system-os-lab.html

MODEL LAB DETAILS

BATCH	REGISTER NO.	MODE OF LAB CONDUCT	DATE	TIMING
1	810423205064 - 810423205189 LE1-LE9	Offline		

Google class room code : 7wgkpad
Google class name : II IT B,C U23ITP41 OPERATING SYSTEM LABORATORY

LIST OF QUESTIONS:

1. Basics of UNIX commands
2. Write programs using the following system calls of UNIX operating system fork, exec, getpid, exit, wait, close, stat, opendir, readdir
3. Write C programs to simulate UNIX commands like cp, ls, grep, etc.
4. Shell Programming
5. Write C programs to implement the various CPU Scheduling Algorithms
6. Implementation of Semaphores
7. Implementation of Shared memory and IPC
8. Bankers Algorithm for Deadlock Avoidance
9. Implementation of Deadlock Detection Algorithm
10. Write C program to implement Threading & Synchronization Applications
11. Implementation of the following Memory Allocation Methods for fixed partition
    a) First
12. Implementation of the following Memory Allocation Methods for fixed partition
    a) Worst Fit
13. Implementation of the following Memory Allocation Methods for fixed partition
    a) Best Fit
14. Implementation of Paging Technique of Memory Management
15. Implementation of the following Page Replacement Algorithms
    a) FIFO
16. Implementation of the following Page Replacement Algorithms
    a) LRU
17. Implementation of the following Page Replacement Algorithms
    a) c) LFU
18. Implementation of the various File Organization Techniques
19. Implementation of the following File Allocation Strategies
    a) Sequential
20. Implementation of the following File Allocation Strategies
    a) Indexed
21. Implementation of the following File Allocation Strategies
    a) Linked

VIVA QUESTIONS:

1. What are the different operating systems?
2. What is a boot-strap program?
3. Define BIOS?
4. What is SCSI?
5. What is a sector?
6. What is cache-coherency?
7. What are residence monitors?
8. What is dual-mode operation?
9. Define system calls?
10. Find out layered approach and what is its advantage?
11. What are virtual machines and site their advantages?
12. Define process?
13. What are the states of a process?
14. What are various scheduling queues?
15. Define job queue?
16. How ready queue used in OS?
17. What is a device queue?
18. What is a long term scheduler?
19. What is short term scheduler?
20. What is context switching?
21. Define thread?
22. What are types of threads?
23. What are multithreading models?
24. What is process synchronization?
25. What is critical section problem?
26. What is a semaphore?
27. What is dining philosophers' problem?
28. What is resource allocation graph?
29. How it works in deadlock prevention techniques?

PREPARED BY **VERIFIED BY**

AP/IT **HOD/IT**

APPROVED BY

PRINCIPAL