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

COURSE PLAN (2024-2025 EVEN SEMESTER)

Name of the Faculty				
Designation/Department	Assistant Professor / Information Technology			
Course Code/Name	U23CST43/ Operating System			
Year/Section/Department	II/B/IT			
Credits Details	L: 3	T: 0	P: 0	C: 3
Total Contact Hours Required	45			

Syllabus:

UNIT I/ INTRODUCTION	**No. of Periods: 9**
Computer System - Elements and organization; Operating System Overview - Objectives and Functions - Evolution of Operating System; Operating System Structures – Operating System Services - User Operating System Interface - System Calls – System Programs - Design and Implementation - Structuring methods.	
UNIT II/ PROCESS MANAGEMENT	**No. of Periods: 9**
Processes - Process Concept - Process Scheduling - Operations on Processes - Inter-process Communication; CPU Scheduling, Threads - overview Process Synchronization - The Critical-Section problem - Synchronization hardware – Semaphores – Mutex - Classical problems of synchronization - Monitors; Deadlocks.	
UNIT III/ MEMORY MANAGEMENT	**No. of Periods: 9**
Main Memory - Swapping - Contiguous Memory Allocation – Paging - Structure of the Page Table - Segmentation, Segmentation with paging; Virtual Memory - Demand Paging – Copy on Write - Page Replacement - Allocation of Frames –Thrashing.	
UNIT IV/ STORAGE MANAGEMENT	**No. of Periods: 9**
Mass Storage Structure- Overview, Disk Scheduling and Management; File System Storage-File Concepts, Directory and Disk Structure, Sharing and Protection; File System Implementation- File System Structure, Directory Structure, Allocation Methods, Free Space Management, I/O Systems.	
UNIT V/ VIRTUAL MACHINES AND MOBILE OS	**No. of Periods: 9**
Virtual Machines – History, Benefits and Features, Building Blocks, Types of Virtual Machines and their Implementations, Virtualization and Operating-System Components; Mobile OS - iOS and Android.	
TOTAL HOURS: 45	

Objectives:

1. To understand the basic concepts and functions of operating systems.
2. To understand Processes and Threads.
3. To analyze Scheduling algorithms.
4. To understand the concept of Deadlocks.
5. To analyze various memory management schemes.
6. To understand I/O management and File systems.
7. To be familiar with the basics of Linux system and Mobile OS like iOS and Android.

Text Books:

T1: Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", 9th Edition, John Wiley and Sons Inc.

T2: Andrew S. Tenenbaum, Albert S. Woodhull," Operating Systems- Design and Implementation", 3rd Edition, Pearson publication 2006.

Reference Books:

R1: Ramaz Elmasri, A. Gil Carrick, David Levine, "Operating Systems – A Spiral Approach", Tata McGraw Hill Edition, 2010.

R2: Achyut S. Godbole, Atul Kahate, "Operating Systems", Mc Graw Hill Education, 2016.

R3: Andrew S. Tanenbaum, "Modern Operating Systems", Second Edition, Pearson Education, 2004

R4: Gary Nutt, "Operating Systems", Third Edition, Pearson Education, 2004.

R5: Harvey M. Deitel, "Operating Systems", Third Edition, Pearson Education, 2004.Daniel P

R6: Bovet and Marco Cesati, "Understanding the Linux kernel", 3rd edition, O'Reilly, 2005.

R7: Neil Smyth, "iPhone iOS 4 Development Essentials – Xcode", Fourth Edition, Payload media, 2011.

Websites:

W1: https://www.digimat.in/nptel/courses/video/106106144/L01.html
W2: https://www.tutorialspoint.com/operating_system/os_overview.html

Online Mode of study (if any)

- NPTEL: https://youtu.be/3-ITLMMeeXY
- NPTEL: https://youtu.be/LvaU7Vokg9E
- https://youtu.be/mXw9ruZaxzQ

Course Plan:

Sl.No	Topic	Reference Detail	Page Number	Mode of teaching	Number of Periods Required	Cumulative Period
UNIT I - OPERATING SYSTEM OVERVIEW						
1	Computer System, Elements and organization	T1	7-12	BB	1	1
2	Operating System Structure overview, Objectives and functions	T1	19-21	BB	1	2
3	Evolution of Operating System	T1	62-66	BB	1	3

4	Operating System Structures	R1	105-110	BB	1	4
5	Operating system services, User Operating System Interface	T1	261-265	BB	1	5
6	System Calls	T1	266-277	BB	1	6
7	System Programs	T1	278-283	PPT	1	7
8	Design and Implementation	R2	163-166	BB	1	8
9	Structuring methods.	T1	171-174	BB	1	9
Outcome of Unit I: **CO 1:** Explain the overall view of the computer system and operating system.						
UNIT II - PROCESS MANAGEMENT						
10	Processes, Process Concept	T1	203-204	BB	1	10
11	Process Scheduling, Operations on Processes	T1, R1	206-213	BB	1	11
12	Inter-process Communication	R3	219-223	BB	1	12
13	CPU Scheduling	T1	315-316	BB	1	13
14	Threads	R3	317-318	PPT	1	14
15	overview Process Synchronization, the Critical-Section problem	T1	322-323	BB	1	15
16	Synchronization hardware, Semaphores	T1	323-327	BB & VIDEO	1	16
17	Mutex, Classical problems of synchronization	T1	337-339	BB	1	17
18	Monitors, Deadlocks	T2	789-792	BB	1	18
Outcome of Unit II: **CO 2:** Understand the various scheduling algorithms and process synchronization.						
UNIT III - MEMORY MANAGEMENT						
19	Main Memory	T1	351-358	BB	1	19
20	Swapping, Contiguous Memory Allocation,	R5	360-363	PPT	1	20
21	Paging, Segmentation, Segmentation with paging	T1	364-366	BB	1	21
22	Virtual Memory – Background	R4, W2	397-400	BB	1	22
23	Demand Paging	T1	401-408	BB	1	23
24	Copy on write	T1, T2	409-420	BB	1	24
25	Page Replacement	T1	425-428	PPT	1	25
26	Allocation of frames	T1	430-432	BB	1	26
27	Thrashing	T1	434-436	BB	1	27
Outcome of Unit III: **CO 3:** Compare and contrast various memory management schemes.						
UNIT IV – STORAGE MANAGEMENT						
28	Mass Storage Structure	T1	470-472	BB	1	28

29	Overview, Disk Scheduling and Management	T1	482-485	BB & VIDEO	1	29
30	File System Storage-File concepts	T1	503-510	BB	1	30
31	Directory and Disk Structure	R6	515-520	BB	1	31
32	Sharing and Protection	T1, W1	526-530	BB	1	32
33	File System Implementation- File System Structure	R6, W3	543-546	BB	1	33
34	Directory structure	T1	552-553	PPT	1	34
35	Allocation Methods	R7	554-556	BB	1	35
36	Free Space management, I/O Systems.	T1	558-560	BB	1	36
Outcome of Unit IV: **CO4:** Illustrate the functionality of file systems, I/O systems.						
UNIT V – VIRTUAL MACHINES AND MOBILE OS						
37	Virtual Machines	T1	741-745	BB	1	37
38	History, Benefits and Features	T1	746-748	BB	1	38
39	Building Blocks	T1	749-750	BB	1	39
40	Types of Virtual Machines	T2	752-753	BB	1	40
41	Implementations	T1	755-758	BB	1	41
42	Virtualization	T1	760-762	BB	1	42
43	Operating-System Components	W1	765-768	PPT, Nptel Video	1	43
44	Mobile OS	W1	769-770	PPT, Nptel Video	1	44
45	iOS and Android.	W3	771-773	PPT, Nptel Video	1	45
Outcome of Unit V: **CO 5:** Explain the concept of Virtual Machines. **CO 6:** Compare iOS and Android Operating system.						

Course Outcomes:

At the end of course:

Students should be able to do:

CO 1: Explain the overall view of the computer system and operating system.

CO 2: Understand the various scheduling algorithms and process synchronization.

CO 3: Compare and contrast various memory management schemes.

CO 4: Illustrate the functionality of file systems, I/O systems.

CO 5: Explain the concept of Virtual Machines.

CO 6: Compare iOS and Android Operating system.

Course Outcome Vs Program Outcome Mapping:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	3	1	1	1	1	-	-	-	-	-	-	-	-	-
CO 2	2	1	2	2	2	-	-	-	-	-	-	-	1	-
CO 3	3	3	1	2	2	-	-	-	-	1	-	-	1	-
CO 4	2	2	2	2	2	-	-	-	-	1	-	-	1	-
CO 5	3	2	2	2	2	-	-	-	-	-	-	-	1	-
CO 6	3	3	2	2	2	-	-	-	-	-	-	-	1	-
AVG:	2.67	2	1.67	1.83	1.83	-	-	-	-	1	-	-	1	-

Content beyond Syllabus:

- Bus Based Multiprocessors
- True distributed systems
- Linux Game design in C
- Mind mapping of Windows and Linux

Internal Evaluation Components:

Web portal	Assignment	Components	Topic Number with Topic / Unit Details	Relevance to CO
Web portal 1	--	Assessment – I (60)	Unit I and II	CO 1 & CO2
	1	**Handwritten (20)**	Unit - I 5. Operating system services, User Operating System Interface. 8. Design and Implementation	CO 1
	2	**Poster / PPT Presentation (20)**	Unit – II 11. Process Scheduling, Operations on Processes 18. Monitors, Deadlocks	CO2
Web portal 2	--	**Assessment – II (60)**	Unit III and IV	CO3 & CO4
	3	**Seminar (20)**	Unit – III 21. Paging, Segmentation, Segmentation with paging 25. Page Replacement	CO3
	4	**Case Study (20)**	Unit – IV 29. Overview, Disk Scheduling and Management 33. File System Implementation-	CO4

Web portal	Assignment	Components	Topic Number with Topic / Unit Details	Relevance to CO
			File System Structure	
Web portal 3	--	**Model Exam (75)**	Unit I to V	CO1 to CO6
	5	**MCQ (15)**	Unit I to V	CO1 to CO6
	--	**Course Attendance (10)**	--	--

Submission Details:

Phase 1 (Before AT 1)	Phase 2 (Before AT 2)	Phase 3 (Before Model Exam)
Assignment 1 & 2	**Assignment 3 &4**	**Assignment 5**

Google Classroom Code :

Google Classroom Name : U23CST43 OPERATING SYSTEMS

PLAN OF ASSESSMENT TEST –DISTRIBUTION OF MARKS:

TEST	CO- MARK WISE DISTRIBUTION						BLOOM'S LEVEL MARK WISE DISTRIBUTION					
AT-1	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**	**BTL1**	**BTL2**	**BTL3**	**BTL4**	**BTL5**	**BTL6**
	30	30	-	-	-	-						
AT-2	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**	**BTL1**	**BTL2**	**BTL3**	**BTL4**	**BTL5**	**BTL6**
	-	-	30	30	-	-						
MODEL	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**	**CO6**	**BTL1**	**BTL2**	**BTL3**	**BTL4**	**BTL5**	**BTL6**
	20	20	20	20	10	10						

Prepared By **Verified By**

AP/IT **HOD/IT**

Approved By
Principal