C. U. SHAH UNIVERSITY
Wadhwan City

FACULTY OF: - Computer Science
DEPARTMENT OF: - Master of Computer Application
SEMESTER: -III
CODE: - 5CS03MOS1
NAME: – OPERATING SYSTEM (OS)

Teaching and Evaluation Scheme

Subject Code	Name of the Subject	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
							Theory				Practical (Marks)			
		Th	Tu	Pr	Total		Sessional Exam		University Exam		Internal		University	Total
							Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
5CS03MOS1	Operating System (OS)	4	-	2	6		30	1.5	70	2.5	10	-	40	150

Objectives:-

- Help students become familiar with the fundamental concepts of operating system.
- Help students become competent in recognizing operating systems features and issues.
    - Provide students with sufficient understanding of operating system design and how it impacts application systems design and performance.

Prerequisite:-

- Basics of Computer System Architecture.
- C / C++ Programming Skills.

Course Outline:-

Sr. No.	Course Content	Hours
1	**Computer and Operating System Overview.** Computer system organization and Architecture, Evolution of operating system, Operating system structure and operations overview of Process, Memory, I/O , Storage	06
2	**Processes** Process states, PCB(Process Control Block), Operation on process, Process Scheduling, IPC (Inter Process Communication),Examples of IPC System Thread Overview, Multithreading model	08

3	**Concurrency Control:**	08
	Principles of concurrency ,Mutual Exclusion,	
	Semaphore, Monitors, Message Passing,	
	Reader/Writer problem, Deadlock characterization, Method for handling deadlock,	
	Deadlock prevention, Deadlock avoidance/Detection,	
	Dining philosophers problem	
4	**Memory Management**	08
	Memory Partitioning ,Swapping,	
	Continuous Memory allocation,	
	Paging, Segmentation,	
	Virtual memory management System:	
	Demand paging,	
	copy on write, Page Replacement	
5	**Scheduling**	07
	Types of Scheduling	
	Scheduling Algorithm , Unix scheduling	
	Multiprocessor Scheduling	
	Linux Scheduling	
6	**I/O Management and Disk Scheduling**	06
	I/O Devices, Organization of the I/O Function,	
	OS Design Issues, I/O Buffering,	
	Disk Scheduling,	
	RAID Structure, Disk cache, UNIX I/O.	
7	**File Management**	05
	Overview, Access Methods, Directory structure,	
	File System Mounting	
	File Sharing,	
	Protection	

PRACTICAL LIST:

1	UNIX commands: date, ls, who, cal, ps, wc, cat, uname, pwd, mkdir, rmdir, cd, cp, rm, mv, diff, chmod, grep, sed, head, tail, cut, paste, sort, find. Etc.
2	Simple Shell Script Programs: Programs using system calls, library function calls to display and write strings on standard output device and files. Simple programs related to conditional and looping and branching statements.
3	Accept numbers and perform addition, subtraction, division and multiplication.
4	Accept the string and checks whether the string is palindrome or not.
5	Accept filename and displays last modification time if file exists, otherwise display appropriate message.
6	Fetch the data from a file and display data into another file in reverse order.

7	Write a script to copy the file system from two directories to a new directory in such a way that only the latest file is copied in case there are common files in both the directories.
8	Write a script to delete zero sized files from a given directory (and all its sub-directories).
9	Write a script to display the date, time and a welcome message (like Good Morning etc.). The time should be displayed with "a.m." or "p.m." and not in 24 hours notation.
10	Write a script to make following file and directory management operations menu based: Display current directory List directory Make directory Change directory Copy a file Rename a file Delete a file Edit a file
11	Write a script which reads a text file and output the following Count of character, words and lines. File in reverse. Frequency of particular word in the file. Lower case letter in place of upper case letter.
12	Write A Script To Perform Following String Operations Using Menu: COMPARE TWO STRINGS JOIN TWO STRINGS FIND THE LENGTH OF A GIVEN STRING OCCURRENCE OF CHARACTER AND WORDS REVERSE THE STRING
13	Write a script to display all words of a file in ascending order.
14	Write a script to display all lines of a file in ascending order.
15	Write a script to calculate gross salary for any number of employees Gross Salary =Basic + HRA + DA. HRA=10% and DA= 15%.

Learning Outcomes:
- He/She should be able to understand the concepts of Operating System.
- He/She should be aware of operating system failure of know error.
- He/She should be able to solve problems of application errors due to Operation of function and define base architecture in terms of OS fundamentals.

Teaching & Learning Methodology:
- The module will be delivered via lectures (by teaching aids i.e. Projectors PPT and PDF's) and assignments. Students are also expected to undertake self-study during this course.

Books Recommended:
1. Operating System Principles, **A. Silberschats, Peter Galvin, Greg Gagne,** WILEY-India 7th Edition.
2. Operating Systems, **William Stallings,** Pearson 6th Edition.
3. Operating Systems, **Achyut Godbole,** Tata McGraw- Hill.
4. Unix Systems Programming : Communication, Concurrency and Threads, **Kay Robbins,** 2-Edition, Pearson Education
5. Unix concepts and applications, **Sumitabha Das**, TMH Publications.
6. Unix programming, **Stevens,** Pearson Education.