SWARNANDHRA

COLLEGE OF ENGINEERING AND TECHNOLOGY

(AUTONOMOUS)

SEETHARAMPURAM, NARSAPUR-534280, WG- DT, AP

DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS

TEACHING PLAN

Course Code	Course Title	Year/Sem	Branch	Contact Hrs/Week	Academic Year	Course of commenced date
24MC2TE2	ADVANCED UNIX PROGRAMMING	I/II	MCA	6	2025-2026	02-02-2026

COURSE OUTCOMES (CO): Students are able to

1. Describe UNIX utilities and develop basic shell scripts for file handling and process management.(**K2)**
2. Handle UNIX files and directories using system calls and directory functions, and differentiate between system calls and library functions.(K3)
3. Analyze UNIX process management and signal handling, including handling zombie and orphan processes.(K4)
4. Implement inter-process communication techniques such as pipes and message queues for client-server programs.(K6)
5. Evaluate the use of shared memory and sockets for client-server communication using TCP and UDP protocols.(K5)

Unit	Outcome/ Blooms Level		TOPIC/ACTIVITY	Text Books	Contact HOURS	Delivery Method
I	Describe UNIX utilities and develop basic shell scripts for file handling and process management		**UNIT-I Review of UNIX Utilities and Shell Programming**			Chalk & Board & PPT
		1.1	File handling utilities	T1	2	
		1.2	Security by file permissions	T1	1	
		1.3	Process utilities, disk utilities	T1	1	
		1.4	Networking commands	T1	2	
		1.5	Backup utilities	T1	1	
		1.6	Shell, Shell responsibilities	T1	1	
		1.7	Pipes and input redirections	T1	1	
		1.8	Output redirection, here documents	T1	1	
		1.9	The shell as a programming language	T1	1	
		1.10	Shell metacharacters, shell	T1	1	

			variables,			
		1.11	Shell commands, the environment	T1	1	
		1.12	Control structures, shell script examples.	T1	1	
II	Handle UNIX files and directories using system calls and directory functions, and differentiate between system calls and library functions. (K3)		**UNIT-II UNIX Files**			Chalk & Board & PPT
		2.1	UNIX file structure	T1	1	
		2.2	Directories, files and devices	T1	1	
		2.3	System calls library functions	T1	1	
		2.4	Low level file access	T1	1	
		2.5	Usage of open, create, read, write, close, lseek, stat, fstat, ioctl, umask, dup, dup2,	T1	2	
		2.6	Differences between system calls and library functions	T1	1	
		2.7	**File and Directory Maintenance** chmod, chown, unlink, link,symlink, mkdir, rmdir, chdir, getcwd	T1	2	
		2.8	**Directory Handling System Calls:** opendir, readdir, closedir, rewinddir, seekdir, telldir.	T1	2	
III	Analyze UNIX process management and signal handling, including handling zombie and orphan processes.(K4)		**UNIT-III UNIX Process**			Chalk & Board & PPT
		3.1	**Threads, and Signals:** Process , Process structure	T1	2	
		3.2	Starting new process, waiting for a process	T1	1	
		3.3	Zombie process, orphan process	T1	2	
		3.4	Process control, process identifiers	T1	1	
		3.5	System calls for process management-fork ,vfork, exit, wait, waitpid, exec, system	T1	2	
			Mid Exam-I			
		3.6	Signal functions, unreliable signals	T1	1	
		3.7	Interrupted system calls	T1	2	
		3.8	kill, raise, functions, alarm, pause functions	T1	2	
		3.9	abort, sleep functions	T1	1	
IV	Implement inter-process communication techniques such as pipes and message queues for client-server programs.		**UNIT-IV Inter process Communication**			Chalk & Board PPT with Video Demonstration
		4.1	Introduction to IPC	T2	2	
		4.2	IPC between processes on a single computer system	T2	1	
		4.3	IPC between processes on different systems	T2	1	
		4.4	pipes, FIFOs, message queues	T2	2	
		4.5	Semaphores and shared memory	T2	2	
		4.6	Differences between pipes and FIFOs	T2	1	
		4.7	Implementing a client server program using pipes and FIFOs	T2	1	
		4.8	**Message Queues**-:IPC permission issues	T2	2	
		4.9	Access perm queues , client/server	T2	1	

	(K6)	4.10	**Semaphores:** Creating semaphore Sets	T2	1	
		4.11	Unix kernel support for semaphores	T2	1	
		4.12	Unix APIs for semaphores	T2	1	
		4.13	File locking using semaphores.	T2	1	
V	Evaluate the use of shared memory and sockets for client-server communication using TCP and UDP protocols.(K5)	**UNIT-V Shared Memory and Sockets**				Chalk & Board PPT with Video Demonstration
		5.1	Working with shared memory segments	T2	1	
		5.2	UNIX kernel support shared memory	T2	1	
		5.3	client/server example	T2	1	
		5.4	**Sockets:** Berkeley sockets	T2	1	
		5.5	socket structure	T2	1	
		5.6	socket system calls for connection oriented protocol and connectionless protocol	T2	2	
		5.7	implementing client server programs using TCP and UDP sockets	T2	1	

Course Beyond Syllabus		UNIX Standardization and Implementations	**Web Resources**	1	
MIDEXAM 2					
	TOTALCLASSES				65

Recommended Text Books for Reading:

Sno.	Author(s)	Title	Publisher	Edition	Year
1	Richard Stevens	Advanced Programming in the UNIX Environment	Addison-Wesley	2nd	2012
2	Sumitabha Das	Unix Concepts and Applications	McGraw-Hill	3rd	2017

Reference Text Books:

Sno.	Author(s)	Title	Publisher	Year
1	G. Kochan	Unix Shell Programming	Sams Publishing	2003
2	M Sumitabha Das	Unix and Shell Programming	Tata McGraw Hill	2016

WEB RESOURCES:

1. https://archive.nptel.ac.in/courses/117/106/117106113/
2. https://stevens.netmeister.org/631/
3. https://www.cs.fsu.edu/~asriniva/courses/aup02/lectures.html

Faculty **Head of the Department** **Principal**