

# Lovely Professional University, Punjab

Course Code	Course Title	Course Planner
CSE325	OPERATING SYSTEMS LABORATORY	23789::Manpreet Singh

**Course Outcomes :**Through this course students should be able to

CO1 :: Discuss basic Shell commands to do file management.

CO2 :: Analyze various system calls in order to utilize them effectively.

CO3 :: Demonstrate various process management related tasks.

CO4 :: Develop multithreaded processes using pthread library.

CO5 :: Apply the various synchronization problems to ensure data consistency using mutex and semaphores.

CO6 :: Analyze different inter process communication strategies.

	TextBooks ( T )		
Sr No	Title	Author	Publisher Name
T-1	BEGINNING LINUX PROGRAMMING	NEIL MATHEW & RICHARD STONES	WILEY

	Reference Books ( R )		
Sr No	Title	Author	Publisher Name
R-1	UNIX NETWORK PROGRAMMING	RICHARD STEVENS	PRENTICE HALL

Relevant Websites ( RW )		
Sr No	(Web address) (only if relevant to the course)	Salient Features
RW-1	<a href="http://nptel.ac.in/courses/106108101/pdf/Lecture_Notes/Mod%207_LN.pdf">http://nptel.ac.in/courses/106108101/pdf/Lecture_Notes/Mod%207_LN.pdf</a>	Inter Process Communication
RW-2	<a href="http://www.yolinux.com/TUTORIALS/LinuxTutorialRedHatInstallation.html">http://www.yolinux.com/TUTORIALS/LinuxTutorialRedHatInstallation.html</a>	Linux installation
RW-3	<a href="http://www.yolinux.com/TUTORIALS/LinuxTutorialPosixThreads.html">http://www.yolinux.com/TUTORIALS/LinuxTutorialPosixThreads.html</a>	Thread Creation
RW-4	<a href="https://dextutor.com/fork-system-call/">https://dextutor.com/fork-system-call/</a>	process creation
RW-5	<a href="https://dextutor.com/write-read-system-call/">https://dextutor.com/write-read-system-call/</a>	system calls
RW-6	<a href="https://dextutor.com/home/">https://dextutor.com/home/</a>	OS concepts and lab topics are demonstrated with practical examples.

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Audio Visual Aids ( AV )		
Sr No	(AV aids) (only if relevant to the course)	Salient Features
AV-1	<a href="https://youtu.be/UHh51wZgkes">https://youtu.be/UHh51wZgkes</a>	basic commands to begin Linux
Software/Equipments/Databases		
Sr No	(S/E/D) (only if relevant to the course)	Salient Features
SW-1	Lab work	Ubuntu or CentOS

### Detailed Plan For Practicals

Practical No	Broad topic	Subtopic	Other Readings	Learning Outcomes
Practical 1	Introduction to Linux	Basic Linux Commands: ls, cat, man, cd, touch, cp, mv, rmdir, mkdir, rm, chmod, pwd	AV-1	Introduction to Linux. Student will be able to understand basic working of Linux
Practical 2	Introduction to Linux	Basic Linux Commands: ls, cat, man, cd, touch, cp, mv, rmdir, mkdir, rm, chmod, pwd	AV-1	Introduction to Linux. Student will be able to understand basic working of Linux
Practical 3	Simulation of Shell commands using system calls	file/directory related system calls / library functions (read, write, open, close, lseek, opendir, readdir, closedir, etc)	RW-2 RW-5	Student learns to simulate shell commands using system calls. Evaluation 1
Practical 4	Simulation of Shell commands using system calls	file/directory related system calls / library functions (read, write, open, close, lseek, opendir, readdir, closedir, etc)	RW-2 RW-5	Student learns to simulate shell commands using system calls. Evaluation 1
Practical 5	Process creation and threading	Creating processes	RW-3	Student will be able to write programs that make use of multi processing environment.
	Process creation and threading	Creating Threads		Student will be able to write programs that make use of multi processing environment.
Practical 6	Process creation and threading	Replacing process image using execlp	RW-4	Student will be able to write programs that make use of multi processing environment. Practical 7: Evaluation 2
	Process creation and threading	Process duplication using fork		Student will be able to write programs that make use of multi processing environment. Practical 7: Evaluation 2
Practical 7	Process creation and threading	Process duplication using fork	RW-4	Student will be able to write programs that make use of multi processing environment. Practical 7: Evaluation 2
	Process creation and threading	Replacing process image using execlp		Student will be able to write programs that make use of multi processing environment. Practical 7: Evaluation 2

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Practical 8	Synchronization	Race Condition		Student learns to implement solutions to synchronization problems
Practical 9	Synchronization	Synchronization with Mutexes		Student learns to implement solutions to synchronization problems. Practical 10 :Evaluation 3
	Synchronization	Synchronization with semaphores	RW-6	Student learns to implement solutions to synchronization problems. Practical 10 :Evaluation 3
Practical 10	Synchronization	Synchronization with semaphores	RW-6	Student learns to implement solutions to synchronization problems. Practical 10 :Evaluation 3
	Synchronization	Synchronization with Mutexes		Student learns to implement solutions to synchronization problems. Practical 10 :Evaluation 3
Practical 11	Inter-process communication	Pipes, popen and pclose functions	SW-1	Student learns to create process that can share data with each other
Practical 12	Inter-process communication	Stream pipes, passing file descriptors		Student learns to create process that can share data with each other Practical 12: Evaluation 4 Practical 13: Programs to implement pipes
Practical 13	Inter-process communication	Stream pipes, passing file descriptors		Student learns to create process that can share data with each other Practical 12: Evaluation 4 Practical 13: Programs to implement pipes
Practical 14	Inter-process communication	Shared memory		Student learns to create process that can share data with each other
	Inter-process communication	Message passing	RW-1	Student learns to create process that can share data with each other
	<b>SPILL OVER</b>			
Practical 15	Spill Over			