Unix Operating Systems

Course Code	19CS4601D	Year	III	Semester	II
Course Category	Program Elective-II	Branch	CSE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Operating Systems
Continuous Internal Evaluation :	30	Semester End Evaluation:	70	Total Marks:	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		
CO1	Understand the basic concepts of UNIX systems.	L2
CO2	Apply the concepts of process subsystem in uniprocessor and multiprocessor systems	L3
CO3	Apply the concepts of file systems in Unix kernels	L3
CO4	Analyze various schedulers for different types of processes.	L4

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:Substantial, 2: Moderate, 1:Slight)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3													
CO2	3													
CO3	3												2	
CO4		3							2	2				2

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<tr><td colspan="3" align="center">Syllabus</td></tr>
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Unit No.	Contents	Mapped CO
I	**Introduction to UNIX**: The process and the kernel, Mode, space and context, Process abstraction, Executing in kernel mode, synchronization, and process scheduling.	**CO1,CO2**
II	**Introduction to Threads**: Fundamental abstractions, Lightweight process design, Issues to consider, User level thread libraries, scheduler activations	**CO1,CO2**
III	**Process Scheduling**: Clock interrupts handling, Scheduler Goals, Traditional UNIX scheduling, Solaris 2.x Scheduling Enhancements.	**CO1,CO2,CO4**
IV	**Synchronization and Multiprocessing**: Introduction, Synchronization in Traditional UNIX Kernels, Multiprocessor Systems, Multiprocessor synchronization issues, Semaphores, spin locks, condition variables, Read-write locks, Reference counts.	**CO1,CO2,CO3**
V	**File system interface and framework** : The user interface to files, File systems, Special files, File system framework, The Vnode/Vfs architecture, Implementation Overview, File System dependent objects, Mounting a file system, Operations on files. **File System Implementations** : System V file system (s5fs) implementation, Berkeley FFS, FFS functionality enhancements and analysis, Temporary file systems, Buffer cache and other special-purpose file systems.	**CO1,CO3**

<table>
<tr><td align="center">Learning Resources</td></tr>
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Text Books

1. UNIX Internals, UreshVahalia, 2005, Pearson Education.

References

1. Uresh Vahalia, UNIX Internals, Pearson Education, 1997

2. Advanced Programming in the UNIX Environment, Richard Stevens, Stephen A. Rago, Second edition, 2005, Pearson Education.

e-Resources and other Digital Material

1. https://www.tutorialspoint.com/unix/index.html

2. https://www.cse.iitb.ac.in/~mythili/teaching/cs347_autumn2016/notes/09-filesystem-io.pdf