

COURSE CODE	COURSE TITLE	L	T	P	C
1152CS114	UNIX INTERNALS	3	0	0	3

Course Category: Program Elective

A. Preamble:

UNIX is a computer Operating System which is capable of handling activities from multiple users at the same time. Knowledge of UNIX Internals helps in understanding similar systems (for example, NT, LINUX) & designing high performance UNIX applications

B. Prerequisite Courses:

Sl. No	Course Code	Course Name
1	1151CS110	Computer Organization and Architecture
2	1151CS108	Operating System

C. Related Courses:

Sl. No	Course Code	Course Name
1	1152CS118	Distributed and Parallel Computing

D. Course Educational Objectives:

Students undergoing this course are exposed to

- Get thorough understanding of the kernel.
- Understand the file organization and management.
- Enhance knowledge about various system calls.
- Have knowledge of process architecture, process control & scheduling and memory management.

E. Course Outcomes:

Upon the successful completion of the course, students will be able to:

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Explain the basic concepts of UNIX Operating System .	K2
CO2	Explain the operational concepts of Buffer, Inode	K2
CO3	Discuss the various operations of File concepts.	K2
CO4	Describe the various aspects of Process Control.	K2
CO5	Apply various Scheduling techniques for a given situations.	K3

F. Correlation of Cos with Pos:

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO1	M												L		
CO2	M				M			M					L		L
CO3	M	M			M			H		M	L		L	L	L
CO4	M	M			M			H		M	L		L	M	L
CO5	M	H			M			H		M	L		L	M	M

H- High; M-Medium; L-L

G. Course Content:

UNIT I Introduction to UNIX

9

History, need of change, Standards The process and the kernel: Mode, space and context, Process abstraction, executing in kernel mode, synchronization by blocking interrupts, process scheduling, signals, process creation, termination, awaiting process termination, zombie processes

UNIT II Buffer and Inode

9

The Buffer Cache-Headers-Buffer Pool-Buffer Retrieval-Reading and Writing Disk Blocks – Advantages and Disadvantages. Internal Representation of Files-Inodes-Structure-Directories-Path Name to Inode- Super Block-Inode Assignment-Allocation of Disk Blocks –Other File Types.

UNIT III File System Interface and Framework

9

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.

UNIT IV Inter Process Communication

9

Process Tracing – System V IPC – Network Communications – Sockets – Messages – Message Data Structures – Message Passing Interface – Ports – Name Space – Data Structures – Port Translations – Message Passing Process Scheduling and Time: Process scheduling – System calls for Time – Clock – Scheduler goals – Process priorities – Scheduler Implementation – Run Queue Manipulation – The SVR4 Scheduler; Memory Management Policies: Swapping – Demand Paging – A Hybrid System with swapping and demand paging

UNIT V UNIX Tools and Programming

9

Shell programming – UNIX commands – Text processing – sed and awk utilities – grep utility – Introduction to Lex, Yacc utilities – Introduction to Perl programming.

Total: 45 hours

H. Learning Resources

i. TEXTBOOK:

1. Maurice J. Bach, “The Design of the Unix Operating System”, Pearson Education,2002.

ii.REFERENCES

1. UreshVahalia, “UNIX Internals: The New Frontiers”, Prentice Hall, 2000.
2. John Lion, “Lion’s Commentary on UNIX”, 6th edition, Peer-to-Peer Communications, 2004.
1. Daniel P. Bovet & Marco Cesati, “Understanding the Linux Kernel”, O’REILLY, Shroff Publishers &Distributors Pvt. Ltd, 2000.

iii. Online resources

<http://www.annaunivedu.in/2013/01/cs2028-unix-internals-syllabus->