NARSIMHA REDDY ENGINEERING COLLEGE
UGC-AUTONOMOUS INSTITUTION

An **Autonomous** Institute
NAAC Accreditation 'A' Grade
Accredited by **NBA**
Approved by **AICTE**, Affiliated to **JNTUH**

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SYLLABUS

Course Code	Category	Hours/ Week			Credits	Maximum Marks		
		L	T	P		CIE	SEE	TOTAL
23CS403	Professional Core	3	0	0	3	40	60	100
Contact Classes:48	Tutorial Classes: Nil	Practical Classes:-				TotalClasses:48		

Prerequisites:

1. A course on "Computer Programming and Data Structures".
2. A course on "Computer Organization and Architecture".

Course Objectives:

1. Introduce operating system concepts(i.e., processes, threads, scheduling, synchronization, deadlocks, memory management, file and I/O subsystems and protection)
2. Introduce the issues to be considered in the design and development of operating system
3. Introduce basic Unix commands, system call interface for process management, inter process communication and I/O in Unix

Course Outcomes:

1. Will be able to control access to a computer and the files that may be shared
2. Demonstratetheknowledgeofthecomponentsofcomputersandtheirrespective roles in computing.
3. Ability to recognize and resolve user problems with standard operating environments.
4. Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.

UNIT-I

OperatingSystem-Introduction,Structures-SimpleBatch,Multiprogrammed,Time-shared,Personal Computer, Parallel, Distributed Systems, Real-Time Systems, System components, Operating System services, System Calls
Process-Process concepts and scheduling, Operations on processes, Cooperating Processes, Threads

UNIT-II
CPU Scheduling- Scheduling Criteria, Scheduling Algorithms, Multiple - Processor Scheduling. System call interface for process management-fork, exit, wait, wait pid, exec **Deadlocks**- System Model, Deadlocks Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock

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UNIT–III

Process Management and Synchronization-The Critical Section Problem, Synchronization Hardware, Semaphores, and Classical Problems of Synchronization, Critical Regions, Monitors.   **Inter process Communication Mechanisms:** IPC between processes on a single computer system, IPC   between processes on different systems, using pipes, FIFOs, message queues, shared memory.

UNIT-IV
Memory Management and Virtual Memory - Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging, Demand Paging, Page Replacement, Page Replacement Algorithms.

UNIT-V
File System Interface and Operations-Access methods, Directory Structure, Protection, File System Structure, Allocation methods, Free-space Management. Usage of open, create, read, and write, close, lseek, stat, ioctl system calls.

TEXTBOOKS:
1. Operating System Principles-Abraham Silberchatz, Peter B. Galvin, Greg Gagne 7th Edition, John Wiley.
2. Advanced programming in the UNIX environment, W. R. Stevens, Pearson education.

REFERENCEBOOKS:

1. Operating Systems- Internals and Design Principles, William Stallings, Fifth Edition– 2005,
1. Pearson Education/PHI
2. Operating System a Design Approach-Crowley, TMH.
3. Modern Operating Systems,Andrew S. Tanenbaum 2nd edition, Pearson/PHI
4. UNIX programming environment, Kernighan and Pike, PHI/ Pearson Education
5. UNIX Internals-The New Frontiers, U. Vahalia, Pearson Education.