**JNTUA COLLEGE OF ENGINEERING (AUTONOMOUS):: ANANTHAPURAMU**

**\*\*\*\* DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING\*\*\*\***

**II B.TECH – II SEMESTER(R-19)**

**Operating Systems Lab**

**L T P C**

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**Course Objectives:**

1. To familiarize students with the architecture of OS.
2. To provide necessary skills for developing and debugging CPU Scheduling algorithms.
3. To elucidate the process management and scheduling and memory management.
4. To explain the working of an OS as a resource manager, file system manager, process manager, memory manager, and page replacement tool.
5. To provide insights into system calls, file systems and deadlock handling.

**List of Experiments**

1. Practicing of Basic UNIX Commands.

2. Write programs using following UNIX operating system calls

Fork, exec, getpid, exit, wait, close, stst, opendir and readdir

3. Simulate UNIX commands like cp, ls, grep, etc.,

4. Simulate the following CPU scheduling algorithms

a) Round Robin b) SJF c) FCFS d) Priority

5. Implement dynamic priority scheduling algorithm.

6. Assume that there are five jobs with different weights ranging from 1 to 5. Implement round robin algorithm with time slice equivalent to weight.

7. Implement priority scheduling algorithm. While executing, no process should wait for more than 10 seconds. If waiting time is more than 10 seconds that process has to be executed for at least 1 second before waiting again.

8. Control the number of ports opened by the operating system with

a) Semaphore b) Monitors.

9. Simulate how parent and child processes use shared memory and address space.

10. Simulate sleeping barber problem.

11. Simulate dining philosopher’s problem.

12. Simulate producer and consumer problem using threads.

13. Implement the following memory allocation methods for fixed partition

a) First fit b) Worst fit c) Best fit

14. Simulate the following page replacement algorithms

a) FIFO b) LRU c) LFU etc.,

15. Simulate Paging Technique of memory management

16. Simulate Bankers Algorithm for Dead Lock avoidance and prevention

17. Simulate following file allocation strategies

a) Sequential b) Indexed c) Linked

18. Simulate all File Organization Techniques

a) Single level directory b) Two level c) Hierarchical d) DAG

**Reference Books:**

1. Abraham Silberchatz, Peter B. Galvin, Greg Gagne, “Operating System Concepts”, Eighth Edition, John Wiley.

2. “Operating Systems: Internals and Design Principles”, Stallings, Sixth Edition–2009, Pearson Education 3. Andrew S Tanenbaum “Modern Operating Systems”, Second Edition, PHI.

4. S. Haldar, A.A. Aravind, “Operating Systems”, Pearson Education.

5. B.L.Stuart, “Principles of Operating Systems”, Cengage learning, India Edition.2013-2014

6. A.S.Godbole “Operating Systems”, Second Edition, TMH. 7. P.C.P. Bhatt, “An Introduction to Operating Systems”, PHI.

**Course Outcomes:** Students should be able to

1. Trace different CPU Scheduling algorithm (L2).
2. Implement Bankers Algorithms to Avoid and prevent the Dead Lock (L3).
3. Evaluate Page replacement algorithms (L5).
4. Illustrate the file organization techniques (L4).
5. Illustrate shared memory process (L4).
6. Design new scheduling algorithms (L6)