ST.JOSEPH’S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM

IV SEMESTER **COMPUTER SCIENCE**  Time: 4Hrs/Week

CS 4604 (3) **OPERATING SYSTEMS** Max.Marks:100

w.e.f.20-21 admitted batch-“20AH” **SYLLABUS**

**COURSE OBJECTIVES:**

To enable the students to:

* Understand the overall structure and components of operating system.
* Analyze the key concept of Process Management and concurrency problem.
* Understand different approaches to memory management.

**COURSE OUTCOMES:**

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

* Demonstrate the structure and design of operating systems.
* Compare various algorithms for process scheduling.
* Apply various deadlock handling strategies to solve resource allocation problems.
* Evaluate the performance of different memory management techniques and page replacement algorithms and therefore develop employability skills.
* Describe file concepts and analyse various disk scheduling strategies.

**UNIT- I**

What is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems– Multiprogramming Systems, Batch Systems, Time Sharing Systems; Operating Systems for Personal Computers, Workstations and Hand-held Devices, Process Control & Real time Systems.

**UNIT- II**

Processor and User Modes, Kernels, System Calls and System Programs, System View of the Process and Resources, Process Abstraction, Process Hierarchy, Threads, Threading Issues, Thread Libraries; Process Scheduling, Non-Preemptive and Preemptive Scheduling Algorithms.

**UNIT III**

**PROCESS MANAGEMENT:** Deadlock, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock, Deadlock Handling Approaches: Deadlock Prevention, Deadlock Avoidance and Deadlock Detection and Recovery.

Concurrent and Dependent Processes, Critical Section, Semaphores, Methods for Inter-process Communication; Process Synchronization, Classical Process Synchronization Problems: Producer-Consumer, Reader-Writer.

**UNIT IV**

**MEMORY MANAGEMENT:** Physical and Virtual Address Space; Memory Allocation Strategies– Fixed and -Variable Partitions, Paging, Segmentation, Virtual Memory.

**UNIT V**

**FILE AND I/O MANAGEMENT, OS SECURITY:** Directory Structure, File Operations, File Allocation Methods, Device Management, Pipes, Buffer, Shared Memory, Security Policy Mechanism, Protection, Authentication and Internal Access Authorization

Introduction to Android Operating System, Android Development Framework, Android Application Architecture, Android Process Management and File System, Small Application Development using Android Development Framework.

<https://nptel.ac.in/courses/106/105/106105214/>

<http://www.infocobuild.com/education/audio-video-courses/computer-science/OperatingSystems-IIT-Delhi/lecture-36.html>

<https://www.youtube.com/watch?v=AnGOeYJCv6s>

<https://www.youtube.com/watch?v=U1Jpvni0Aak>

<https://nptel.ac.in/content/storage2/courses/126104006/LectureNotes/Week-2_IntroductionToAndroid.pdf>

<https://www.youtube.com/watch?v=fzQcQV0UCUM>

**PRESCRIBED TEXT BOOK:**

Operating System Principles by Abraham Silberschatz, Peter Baer Galvin and Greg Gagne (7thEdition) Wiley India Edition.

**REFERENCE BOOKS:**

Operating Systems: Internals and Design Principles by Stallings (Pearson) Operating Systems by J. Archer Harris (Author), Jyoti Singh (Author) (TMH) Online Resources for UNIT V

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ST.JOSEPH’S COLLEGE FOR WOMEN (AUTONOMOUS), VISAKHAPATNAM

IV SEMESTER **COMPUTER SCIENCE**  Time: 2Hrs/Week

CS 4654 (2) **OPERATING SYSTEMS LAB USING C** Max.Marks:50

w.e.f.20-21 admitted batch-“20AH” **SYLLABUS**

**COURSE OBJECTIVES:**

To enable the students to:

* Analyze the concept of Process Management and concurrency problem.
* Understand different approaches to memory management.

**COURSE OUTCOMES:**

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

* Evaluate the performance of different types of CPU scheduling algorithms
* Compare different page replacement policies.
* Implement file organization techniques.
* Recognize need of Banker’s algorithm for deadlock avoidance

1. Write a program to implement Round Robin CPU Scheduling algorithm

2. Simulate SJF CPU Scheduling algorithm

3. Write a program the FCFS CPU Scheduling algorithm

4. Write a program to Priority CPU Scheduling algorithm

5. Simulate Sequential file allocation strategies

6. Simulate Indexed file allocation strategies

7. Simulate Linked file allocation strategies

8. Simulate MVT and MFT memory management techniques

9. Simulate Single level directory File organization techniques

10. Simulate two level File organization techniques

11. Simulate Hierarchical File organization techniques

12. Write a program for Bankers Algorithm for Dead Lock Avoidance

13. Implement Bankers Algorithm Dead Lock Prevention.

14. Simulate all Page replacement algorithms.

a) FIFO b) LRU c) LFU

15. Simulate Paging Technique of memory management

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