BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(An AUTONOMOUS INSTITUTION, APPROVED BY AICTE-NEW DELHI, PERMANENTLY AFFILIATED TO JNTUK-KAKINADA, ACCREDITED BY NAAC 'A' GRADE,
2 PROGRAMMES (CSE,EEE) ACCREDITED BY NBA (For A.Y 2023-24 to 2025-26)
Post Box: 26, Amalapuram 533201, Dr.B R Ambedkar Konaseema Dt., A.P.

BR23 B.Tech INF II YEAR II SEMESTER SYLLABUS

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II Year II Semester	OPERATING SYSTEMS & SOFTWARE ENGINEERING LAB (23IT4L01)	0	0	3	1.5

Course Objectives:

The main objectives of the course are to

- Provide insights into system calls, file systems, semaphores,
- Develop and debug CPU Scheduling algorithms, page replacement algorithms, threadimplementation
- Implement Bankers Algorithms to Avoid the Dead Lock
- acquire the generic software development skill through various stages of software lifecycle
- generate test cases for software testing

Experiments covering the Topics:

- UNIX fundamentals, commands & system calls
- CPU Scheduling algorithms, thread processing
- IPC, semaphores, monitors, deadlocks
- Page replacement algorithms, file allocation strategies
- Memory allocation strategies
- Software Requirement Specification, DFD, CFD
- Software estimation, UML diagrams, test case design

Dr.N.Rama Krishnaiah, Professor of CSE,UCEK & Control of Examination JNTUK, kakinada.	Dr.C.Krishna Mohan, Professor of CSE,IIT, Kandi, Hyderabad.	Dr.P.Radha Krishna, Professor of CSE,NIT, Warangal	Mr.Rajesh Bobburi Chief Operating Officer, HighQ Labs Private Limited, Rajahmundry	Dr.Lakshmi Haritha Medida, Associate Professor, R.M.K.Engineering College,Kavaraipettai,Tamilnadu	Dr.K.Srinivas, Professor & HoD Department of CSE, B.V.C.I.T.S, Batlapalem

Course Outcomes:

CO1: Apply basic UNIX commands and system calls to manage processes, files, and directories.
CO2: Simulate process scheduling, memory management, and file allocation techniques to understand operating system functionalities.
CO3: Design software system models using SRS, DFD, ER, and UML diagrams for real-world applications.
CO4: Develop and evaluate software effort estimation and testing strategies using COCOMO, FP models, and test case design.

Sample Experiments in Operating Systems:

1. Practicing of Basic UNIX Commands.
2. Write programs using the following UNIX operating system calls fork, exec, getpid, exit, wait, close, stat, opendir and readdir
3. Simulate UNIX commands like cp, ls, grep, etc.,
4. Simulate the following CPU scheduling algorithms
   a) FCFS b) SJF c) Priority d) Round Robin
5. Control the number of ports opened by the operating system with
   a) Semaphore b) Monitors.
6. Write a program to illustrate concurrent execution of threads using pthreads library.
7. Write a program to solve producer-consumer problem using Semaphores.
8. Implement the following memory allocation methods for fixed partition
   a) First fit b) Worst fit c) Best fit

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9. Simulate the following page replacement algorithms

   a) FIFO b) LRU c) LFU

10. Simulate Paging Technique of memory management.
11. Implement Bankers Algorithm for Dead Lock avoidance and prevention
12. Simulate the following file allocation strategies

    a) Sequential b) Indexed c) Linked

13. Download and install nachos operating system and experiment with it

Sample Experiments in Software Engineering:

1) Perform the following, for the following experiments:
   i. Do the Requirement Analysis and Prepare SRS
   ii. Draw E-R diagrams, DFD, CFD and structured charts for the project.
   a. Course Registration System
   b. Students Marks Analyzing System
   c. Online Ticket Reservation System
   d. Stock Maintenance
2) Consider any application, using COCOMO model, estimate the effort.
3) Consider any application, Calculate effort using FP oriented estimation model.
4) Draw the UML Diagrams for the problem a, b, c, d.
5) Design the test cases for e-Commerce application (Flipcart, Amazon)
6) Design the test cases for a Mobile Application (Consider any example from Appstore)
7) Design and Implement ATM system through UML Diagrams.

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