College of Computer Science and Information Systems | **Department of Computer Science**

Course Code : 227CSS-3 | **Operating Systems**

Contact Hour : 3(0) | **Prerequisite : 111CSS-4**

Coordinator -

2. Course Description

Introduction, history and evolution of operating systems, operating system structure. Introduction to basic UNIX Commands and vi editor, process management and scheduling, inter process communication, process coordination and synchronization, threads (overview, multithreading model and threading issues), CPU scheduling (Basic concepts and scheduling algorithms), deadlocks (deadlock characterization, methods for handling deadlock), deadlock prevention, deadlock avoidance and detection, memory management and introduction to file management.

3. Course Learning Outcomes

SL	By the end of this course, students should be able to:	Linkages to POs
1.	Describe operating system history, services, applications and types.	a(W)
2.	Apply UNIX commands to perform essential operations	i(S)
3.	Illustrate various algorithms of processes, threads, scheduling, synchronization, deadlock, memory management and file system.	a(W),j(W)
4.	Explain operating system support for processes, threads, scheduling, synchronization, deadlock, memory management and file systems	a(W)
5.	Develop programs to make use of various systems calls and implement standard problems/algorithms related to operating systems concepts	b(S),i(S)
6.	Evaluate the different algorithms for CPU Scheduling, synchronization, and deadlock	c(S)

4. Learning Resources

Text	A. Silbershautz, Galvin and Gagne, Operating System Concepts, 9th Edition, John Wiley & Sons.
Reference	Andrew S. Tanenbaum, Modern Operating Systems, 3rd Edition, Prentice Hall
Reference	P.C.P. Bhatt, Operating Systems, 2nd Edition, Prentice Hall India
Reference	William Stallings, Operating Systems, 4th Edition, Prentice Hall

5. Course Content : The list below provides a summary of the material that will be covered during the course

Week	Topics	References Book / Others Source	Special Event	Tutorial Activities	Lab Activities
1.	Overview of Operating System	Chapter 1 - (Text Book) Chapter 1 â€“ (Ref Book 1)	NA	NA	NA
2.	Operating System Structure	Chapter 2 - (Text Book)	NA	NA	NA
3.	Introduction to UNIX commands and vi editor	TBA	NA	Tutorial -1	Lab Activity I
4.	Process Concept	Chapter 3 â€“ 3.1 to 3.6 â€“ Pipes (T.B.)	Quiz-1	Tutorial â€“ 2	Lab Activity II
5.	Multithreaded Programming	Chapter 4 â€“ 4.1, 4.2, 4.3, 4.4 (T.B.)	Assignment-1	Tutorial â€“ 3	Lab Activity III

6.	Multithreaded Programming	Chapter 4 â€“ 4.1, 4.2, 4.3, 4.4 (T.B.)	Assignment-1	Tutorial â€“ 3	Lab Activity III
7.	Process Scheduling	Chapter 5 â€“ 5.1 to 5.5 (T.B.)	Mid Exam-1 (Theory)	Tutorial â€“ 4	Lab Activity IV
8.	Process Scheduling	Chapter 5 â€“ 5.1 to 5.5 (T.B.)	Quiz-2	Tutorial â€“ 5	Lab Activity V
9.	Process Synchronization	Chapter 6 â€“ 6.1 to 6.6 (T.B.)	Assignment 2	NA	Lab Activity VI
10.	Deadlocks	Chapter 7 â€“ 7.1 to 7.7 (T.B.)	Mid Lab Exam	Tutorial â€“ 6	Lab Activity VII
11.	Deadlocks	Chapter 7 â€“ 7.1 to 7.7 (T.B.)	Mid Lab Exam	Tutorial â€“ 6	Lab Activity VII
12.	Memory Management Strategies	Chapter 8 â€“ 8.1 to 8.6 (T.B.)	Mid Exam-2 (Theory)	Tutorial â€“ 7	Lab Activity VIII
13.	Virtual Memory Management	Chapter 9 â€“ 9.1, 9.2, 9.4, 9.5 (T.B.)	NA	Tutorial â€“ 8	Lab Activity IX
14.	Implementing File Systems	Chapter 11 â€“ 11.1, 11.2, 11.4, 11.5 (T.B.)	NA	NA	Lab Revision

6. Evaluation Scheme: The following list is the contribution of course components to the final grade for the course.

Component	Weight (%)
Assignment 1	3
Assignment 2	3
Quiz 1	5
Quiz 2	5
Mid Term 1	12
Mid Term 2	12
Lab Performance and Exam	10
Lab Final	10
Final Exam	40
Total	100