



SYLLABUS

Course Title	Operating System
Course Code	MCAL224
Course Credit	Theory(Hrs) : 4
	Practical(Hrs) : 2
	Tutorial(Hrs) : 0
	Credits : 5

Course Objectives

The objectives of the course are:

- To provide an understanding for the basic concepts, role and purpose of modern OS
- To analyze the use of OS in management of various system elements
- To study the use of different algorithms required to manage various system resources
- To learn the understanding of distributed applications

Detailed Syllabus

Sr. No.	Name of chapter & details	Hours Allotted
Section – I		
1	Computer & Operating System Overview Basic Elements, Instruction Cycle, Concept of Interrupt, The Memory Hierarchy, Concept of Cache Importance of OS: Objectives & Functions, Evolution of OS, Types of OS, Characteristics of Modern OS: Microkernel Architecture, SMP	04
2	Process & Threads The Concept of Process, OS Services for process management, Creation & Termination of Process, PCB, Process States & Models, Process Description, Process Control Structure, Concept of Thread,	07

	Multithreading	
3	Concurrency and Mutual Exclusion Principles of Concurrency, Mutual Exclusion, Semaphores, Monitors, Message Passing, Reader-writer Problem, Concept of Deadlock, Deadlock Prevention, Deadlock Detection, Deadlock Avoidance, Dining Philosophers Problem	08
4	Scheduling Types of Processor Scheduling, Selection Criteria for Scheduling Algorithms, Different Scheduling Algorithms, Thread Scheduling	06
Section – II		
5	Memory Management Requirements of Memory Management, Different Partitioning techniques of Memory, Buddy System, Simple Paging & Segmentation, Locality and Concept of Virtual Memory, Thrashing, VM Based Paging, Segmentation, Combined paging and segmentation, OS Software: Fetch Policy, Replacement Policies, Resident Set Management, Cleaning Policy	09
6	I/O Management & Disk Scheduling I/O Devices, Organization of I/O Function, Evaluation of I/O, I/O Buffering, Disk Scheduling: Performance Parameter, Algorithms, Concept of RAID	06
7	File Management Overview of File System, File Structure, File Management System, File Organization and access, Directories, Secondary Storage Management	05
8	Distributed System Client/Server Computing, Middleware, Distributed Message Passing, Remote Procedure Calls, Clusters : Configuration & Methods	07
9	Case Study UNIX, LINUX Operating System	04

Instructional Method and Pedagogy:

- Lectures will be conducted on the basis of Classroom Response Systems with the use of multimedia projector and black board.
- Assignments based on course contents will be given at the end of each unit/topic and will be evaluated at regular interval.
- Experiments will be based on the practical curriculum and will be evaluated at regular interval.

Course Learning Outcomes:

On the completion of the course, students will be able to:

- **Describe** the components of computer and understand how they are managed by OS
- **Identify** various architectures of OS and understand the design elements of OS
- **Evaluate** the performance of various algorithms used in OS for managing resources
- **Formulate** shell scripts for performing various operations in UNIX environment

Text books:

- Title: Operating Systems: Internals and Design Principles, Pearson Education
Author(s): William Stalling

Reference Books:

- Title: Modern Operating System, Pearson Education
Author(s): Andrew S. Tanenbaum
- Title: Operating System Concepts, Wiley India Edition
Author(s): Abraham Silberschatz & Galvin
- Title: Operating System, McGraw Hill
Author(s): D. M. Dhamdhare
- Title: Understanding Operating System, Course Technology, Cengage Learning
Author(s): Flynn I. M.

Additional Resources

- <http://www.cs.nyu.edu/courses>
- http://www.tutorialspoint.com/operating_system/os_useful_resources.htm
- <http://www.computerhope.com/os.htm>
- <http://williamstallings.com/OperatingSystems/>
- <http://www.pearsonhighered.com/tanenbaum>