

Subject Code: 1ET1100204	Subject Title: Operating System Concepts
Prerequisite	Computer Organization and Architecture

Course Objective: This course enables to understand value of Operating System, its role to manage resources of Computer and Peripherals, Student will gain knowledge of different aspect of Os like Process Management, Memory Management, File Management and I/O Management in detail with prominence given to Linux type of Open Source Operating System.

Teaching Scheme (Hours per week)				Evaluation Scheme (Marks)				
Lecture	Tutorial	Practical	Credit	Theory		Practical		Total
				University Assessment	Continuous Assessment	University Assessment	Continuous Assessment	
3	1	2	5	70	30	30	20	150

Subject Contents			
Sr. No	Topic	Total Hours	Weight (%)
1	Introduction: Introduction to Operating System and its need, Operating System Services, Classifications: Batch Operating System, Multiprogramming Operating System, Time Sharing Operating System, Real Time Systems, Multiprocessor Systems, Distributed Systems.	5	10
2	Processes Management: Process Concept, Process State transitions, Process Control Block, Operation on processes, Context switching, Interprocess Communication, Process Scheduling, CPU Scheduler and Basic Concepts, Scheduling Criteria, CPU Scheduling Algorithms: FCFS, SJF, Round Robin & Priority scheduling.	8	25
3	Deadlocks: Definition: Race Conditions, Critical Section, Mutual Exclusion, Deadlock characteristics, Deadlock Prevention, Deadlock Avoidance banker's algorithm, Deadlock Detection and Recovery.	7	15
4	Memory Management: Introduction to memory management and its significance, logical vs physical address space, Contiguous allocation: Single partition allocation and multiple partition allocation, Fragmentation, Memory Management Techniques: Paging, Segmentation, Virtual Memory, Demand Paging, Page Replacement algorithms: First In First Out algorithm, Least Recently Used Algorithm, Optimal Algorithm	8	20
5	Storage Structure, File and Device Management: Overview of Secondary Storage Structure, Disk structure, Disk scheduling algorithm, RAID Structure, Types of Files, File Access Methods, File Allocation Methods: Contiguous, Linked and Index Allocation, I/O Devices, Device Controllers, Device Drivers, Directory Structure: Single Level, Tree Structured, Acyclic Graph and General Graph Directory, File Protection	9	20
6	Basics of Unix/Linux Operating System : Development Of Unix/Linux, Role & Function Of Kernel, Directory Structure, System Administration	3	10

Course Learning Outcomes (CLO): On completion of this course, the students will be able to:

CLO	Description	Bloom's Taxonomy Level
CLO1	Know the Basic components of the operating system.	1 Remembering
CLO2	Understand the working and Functions of Operating Systems.	2 Understanding
CLO3	Perform Basic Shell Script Programming.	3 Applying

Mapping of CLOs with POs & PSOs

Course Learning Outcomes	Program Outcomes (POs)												Program Specific Outcomes(PSOs)			
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3	PSO 4
CLO 1	L	L	L	M	L	M	M	L	L	L	L	L	L	L	H	L
CLO 2	M	H	M	L	M	L	L	L	L	L	L	L	L	L	M	L
CLO 3	M	H	H	H	H	H	L	M	L	H	H	L	H	M	H	H

H: High, M: Medium, L: Low

List of Book References:

1. Operating System Concepts (8th Edition) by Silberschatz, Peter B. Galvin and Greg Gagne, Wiley Indian Edition (2010).
2. Modern Operating Systems (Third Edition) by Andrew S Tanenbaum, Prentice Hall India (2008).
3. Operating Systems by D.M. Dhamdhare, Tata McGraw Hill 2nd edition.
4. Operating Systems (5th Ed) – Internals and Design Principles by William Stallings, Prentice Hall India, 2000

List of Experiments:

Note: The experiment list provided beneath is for reference only. The course teacher may change/formulate it as per his/her methodology and requirement.

1. Study of Basic commands of Linux/UNIX.
2. Write a Shell program to Display Student Personal Information.
3. Write a Shell program to check if the given number is even or odd.
4. Write a Shell program to check if the given year is leap year or not.
5. Write a Shell program to find the factorial of a number.
6. Write a Shell program to swap the two integers.
7. Write a shell script which will generate first n Fibonacci numbers like: 1, 1, 2, 3, 5, 8.
8. Write a shell script to check if the entered string is palindrome or not.
9. Write a shell script to generate a mark sheet of a student. Take 3 subjects, calculate and display total marks, percentage and Class obtained by the student.
10. Write a shell script to find the sum of digits of a given number