



Course Title: Operating System - Theories and Practices

Course Code: CSIT620

Credit Units: 04

Course Level: PG

L	T	P/S	SW/F W	TOTAL CREDIT UNITS
3	1	-	-	4

Course Objectives:

The course objective is to

- Provide the basic knowledge of the concepts involved in designing and working of an operating system
- Understand how it acts as a resource manager of the system as a whole.
- Describe how CPU management takes place through multiprocessing and switching between various processes.
- Discuss various issues such as Memory conflicts and how these conflicts are resolved by an operating system.

Pre-requisites: Introduction to IT

Course Contents/Syllabus:

	Weightage (%)
Module I Introduction	10%
What is an Operating System; Functions of Operating System; Types of Operating Systems: Simple Batch Systems, Multiprogramming Systems, Time-Sharing Systems, Parallel Systems, Distributed Systems, Real-time Systems	
Module II Process Management	15%
System Components; System Calls; System Programs; System Structure; Events; Process Concept; Process Scheduling; Operation on processes; Multithreading; Cooperating Processes; Interprocess Communication; semaphores; Background process; Virtual Machines	
Module III CPU Scheduling	

Basic Concepts; Scheduling Criteria; Scheduling Algorithms: Multi-Processor Scheduling, Real-Time Scheduling; Algorithmic Evaluation System Models; Methods for Handling Deadlocks; Deadlock Prevention; Deadlock Avoidance; Deadlock Detection; Deadlock Recovery	25%
Module IV Memory Management	25%
Memory Management; Address Space; Memory Management Techniques: Swapping, Paging, Segmentation with paging, Virtual Memory, Demand Paging, Demand Segmentation; Performance of Demand Paging; Page Replacement; Thrashing	
Module V File and Device Management	15%
File Concept; Access Methods; Directory Structure; Protection; File System Structure; File Allocation Methods; I/O Devices; Device Controllers; Device Drivers; Disk structure, Disk scheduling; Disk scheduling Algorithms	
Module VI Linux Operating System	10%
History; Design Principles; Programmer Interface; User Interface; Process Management; Memory Management; File management; Interprocess Communication.	

Student Learning Outcomes: The student will be able:

- explain the objectives and functions of modern operating systems.
- describe the logical structure of, and facilities provided by, a modern operating system.
- analyze the tradeoffs inherent in operating system design.
- differentiate between the concepts of processes, threads and multithreading.
- demonstrate practical experience of mechanisms for handling situations of deadlock among processes.
- categorize different ways of implementing virtual memory.
- discuss networked, client-server, distributed operating systems and how they differ from single user operating systems.

Pedagogy for Course Delivery: The class will be taught using theory and case based method. In addition to assigning the case studies, the students will be given assignments that judge their understanding the concept modern operating systems. Students will be taught using Technical aids like Projectors by way of PowerPoint presentations.

Assessment/ Examination Scheme:

Theory L/T (%)	Lab/Practical/Studio (%)	Total
100		100

Theory Assessment (L&T):

Continuous Assessment/Internal Assessment	End Term Examination
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Components (Drop down)	Class Test	Assignment	Viva	Attendance	
Weightage (%)	10	10	5	5	70

Text & References:

Text:

- Silberschatz Galvin Gagne, Operating Systems Concepts, Wiley Publication, Eighth Edition, 2009.
- A S Tanenbaum, Modern Operating Systems, Prentice Hall of India New Delhi, Third Edition, 2009.

References:

- Operating Systems, Sibsankar Haldar ,Pearson Publications, First Edition, 2009.
- Operating Systems, Garry Nutt, Pearson Publications, Third edition, 2004.
- Milenkovic, Operating Systems: Concepts and Design, First Edition, 1987.