



**Course Title: Operating System Concepts**

**Course Code: CSIT113**

**Credit Units: 04**

**Course Level: UG**

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 (%)
<b>Module I Introduction</b>	<b>10%</b>
Operating System Classifications; Multiprogramming, Time Sharing, Real Time Systems, Multiprocessor Systems, Distributed Systems, Operating System Services.	
<b>Module II Processes Management</b>	<b>25%</b>
Process Concept; States of Process; Operation on processes; Cooperating Processes; Process Scheduling; CPU Scheduler and Basic Concepts; Scheduling Criteria; CPU Scheduling Algorithms; Multi-Processor Scheduling. Deadlocks: Deadlock Characterization; Deadlock Prevention; Deadlock Avoidance; Deadlock Recovery	
<b>Module III Memory Management</b>	<b>25%</b>
Bare Machine; Resident Monitor; Partition; Memory Management Techniques: Paging, Segmentation, Virtual Memory, Demand Paging; Page Replacement algorithms: FIFO algorithm, Least Recently Used Algorithm, Optimal Algorithm.	
<b>Module IV File and Device Management</b>	<b>20%</b>

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	
<b>Module V Security and Protection</b>	<b>15%</b>
Security Policies and Mechanism; Protection and Access Control: Access Matrix Model of Protection, Access Hierarchies, Access List, Capabilities	
<b>Module VI: UNIX Operating System</b>	
Command-Language; User's View of Unix; Implementation of Unix; Unix Summary .	<b>5%</b>

**Student Learning Outcomes:** The student will be able to:

- 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.
- demonstrate practical experience of mechanisms for handling situations of deadlock among processes.
- categorize different ways of implementing virtual memory.

**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:**

<b>Theory L/T (%)</b>	<b>Lab/Practical/Studio (%)</b>	<b>End Term Examination</b>
<b>100%</b>	-	<b>100%</b>

**Theory Assessment (L&T):**

<b>Continuous Assessment/Internal Assessment</b>					<b>End Term Examination</b>
<b>Components (Drop down)</b>	<b>CT</b>	<b>A</b>	<b>Viva</b>	<b>Attendance</b>	
<b>Weightage (%)</b>	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:***

- Maurice J. Bauch , Design of UNIX Operating System, Prentice Hall of India, Third Edition, 2007
- Sibsankar Haldar Operating Systems, Pearson Publications, First Edition, 2010
- Garry Nutt, Operating Systems, Pearson Publications, Third edition, 2004