SCHEME OF COURSEWORK
DEPARTMENT OF INFORMATION TECHNOLOGY

Course Details:

COURSE TITLE	**OPERATING SYSTEMS**		
COURSE CODE	**15CT1110**	**L T P C**	**3 1 0 4**
PROGRAM	**B.TECH**		
SPECIALIZATION	**IT**		
SEMESTER	**IV**		
PRE REQUISITES	**COMPUTER ORGANIZATION**		
COURSES TO WHICH IT IS A PRE REQUISITE	**N/A**		

Course Outcomes (COs):

CO - 1	**Discuss different computer operating systems**
CO - 2	**Compare CPU scheduling algorithms**
CO - 3	**Examine Page Replacement algorithms**
CO - 4	**Differentiate File System and directory implementations**
CO - 5	**Analyze different program and network threats to the system**

Program Outcomes (POs):

A graduate of Information Technology will be able to

PO-1	**Apply the knowledge of mathematics, science, engineering fundamentals and principles of Information Technology to solve problems in different domains.**
PO-2	**Analyze a problem, identify and formulate the computing requirements appropriate to its solution.**
PO-3	**Design and develop software components, patterns, processes, Frameworks and applications that meet specifications within the realistic constraints including societal, legal and economic to serve the needs of the society.**
PO-4	**Design and conduct experiments, as well as analyze and interpret data.**
PO-5	**Use appropriate techniques and tools to solve engineering problems.**
PO-6	**Understand the impact of Information technology on environment and the evolution and importance of green computing.**
PO-7	**Analyze the local and global impact of computing on individual as well as on society and incorporate the results in to engineering practice.**
PO-8	**Demonstrate professional ethical practices and social responsibilities in global and societal contexts.**
PO-9	**Function effectively as an individual, and as a member or leader in diverse and multidisciplinary teams.**
PO-10	**Communicate effectively with the engineering community and with society at large.**
PO-11	**Understand engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects.**
PO-12	**Recognize the need for updating the knowledge in the chosen field and imbibing learning to learn skills.**

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Course Outcome versus **Program Outcomes:**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	3	3	3					2	2	2	2		
CO2	3	2	3	3	3							2	2		
CO3	3	2	3	3	3							2		2	
CO4	3	2	3	3	3							2			
CO5	3	2	3	3	3							2			

S - Strongly correlated, *M* - *Moderately* correlated, *Blank - No correlation*

Assessment Methods	Assignment / Quiz / Mid-Test

Teaching-Learning and Evaluation

Week	Topic/Contents	Course Outcomes	Sample Questions	Teaching Learning Strategy	Assessment Method & Schedule
1.	What Operating System Do, computer system organization, computer system architecture, operating system structure, protection and security.	CO1	1.Explain about operating system in detail	Lecture / Discussion Demonstration	Assignment-1, Test- 1 Quiz-1
2.	Distributed systems, special purpose systems, Computing environments, operating system services, system calls and its types, operating systems generation.	CO1	1.Write about operating systems generation	Lecture / Discussion Demonstration	Assignment-1, Test- 1 Quiz-1
3.	**PROCESS CONCEPT**: Process, Process Control Blocks, Operations on Processes, Interprocess Communication	CO2	1. Define process. Explain operations on process	Lecture / Discussion Demonstration	Assignment-1, Test- 1 Quiz-1
4.	Scheduling Criteria, scheduling algorithms (FCFS, SJF, Round Robin, Priority) and their evaluation, Multiprocessor scheduling.	CO2	1. What is scheduling of Criteria? Explain the algorithm of Round robin scheduling. 2. Explain Multiprocessor scheduling in detail	Lecture / Discussion Demonstration	Assignment-1, Test- 1 Quiz-1
5.	**SYNCHRONIZATION:** The Critical- section	CO2	1. What is critical section? List the requirements for satisfying critical section	Lecture / Discussion Demonstration	Assignment-1, Test- 1 Quiz-1

	problem, Peterson's Solution, Synchronization Hardware, semaphores, classic problems of synchronization, monitors.		problem.		
6.	Synchronization examples, atomic transactions. Case Study: Linux **DEAD LOCKS:** System model, deadlock characterization, Methods for Handling Deadlock, deadlock prevention, detection and Avoidance, recovery from deadlock.	CO2, CO3	1. Disscuss the role of atomic transactions with respect to operating system 2. Explain deadlock and explain various methods for deadlock	Lecture / Discussion Demonstration	Assignment-1, Test- 1 Quiz-1
7.	Test – 1				
8.	**MEMORY MANAGEMENT STRATEGIES:** Swapping, contiguous memory allocation, paging, structure of the page table, segmentation.	CO3	1. What is paging. explain the mechanism of paging	Lecture / Discussion Demonstration	Assignment-2 Test- 2 Quiz-2
9.	**VIRTUAL-MEMORY MANAGEMENT:** Demand paging, Copy on write, page-Replacement algorithms (FIFO, LRU, LFU, Optimal Page Replacement)	CO3	1.Discuss about LRU algorithm in detail	Lecture / Discussion Demonstration	Assignment-2 Test- 2 Quiz-2
10.	**FILE SYSTEMS:** File Concept, Access Methods, Directory Structure, and File System Mounting.	CO4	1.Explain directory structure in detail	Lecture / Discussion Demonstration	Assignment-2 Test- 2 Quiz-2
11.	File system structure, File System Implementation, Directory Implementation, Allocation Methods, Free-space Management, Efficiency and performance, Log-Structured File Systems, Network File Systems.	CO4	1.Explain free space management in detail	Lecture / Discussion Demonstration	Assignment-2 Test- 2 Quiz-2
12.	SECONDARY-STORAGE STRUCTURE: Overview of Mass-storage structure, disk structure, disk	CO4	1.List different types disk scheduling mechanisms	Lecture / Discussion Demonstration	Assignment-2 Test- 2 Quiz-2

	attachment, disk scheduling, swap-space management, RAID structure, stable storage implementation, Tertiary storage structure.				
13.	PROTECTION: Goals of Protection, Principles of Protection, Domain of protection, Access Matrix, Implementation of Access Matrix, Access control, Revocation of Access Rights, Capability- Based systems, Language – Based Protection.	CO5	1.Discuss about principles of protection	Lecture / Discussion Demonstration	Assignment-2 Test- 2 Quiz-2
14.	SYSTEM SECURITY: The Security problem, program threats, system and network threats cryptography as a security tool, user authentication, implementing security defenses, firewalling to protect systems and networks, computer–security classifications. Case Study: Linux	CO5	1. Explain different types of threats in detail.	Lecture / Discussion Demonstration	Assignment-2 Test- 2 Quiz-2
15.	Test – 2				