SCHEME OF COURSE WORK

Course Details:

Course Title	**:** OPERATING SYSTEM			
Course Code	**:** 13CT1104	**L T P C**	**:** 4 1 0 3	
Program:	**:** B.Tech.			
Specialization:	**:** Computer Science & Engineering, Information Technology			
Semester	**:** III			
Prerequisites	**:** Computer Organization			
Courses to which it is a prerequisite	: Distuributed operating system			

Course Outcomes (COs):

1	Discuss different computer operating systems.
2	Compare CPU scheduling algorithms.
3	Examine Page Replacement algorithms.
4	Differentiate File System and directory implementations.
5	Analyze different types of disk scheduling algorithms.

Program Outcomes (POs):

A graduate of Information Technology will be able to

1	Ability to apply the knowledge of mathematics, science,engineering fundamentals and principles of Information Technology to solve problems in different domains.
2	Ability to analyze a problem, identify and formulate the computing requirements appropriate to its solution.
3	Ability to design & develop software applications that meet the desired specifications within the realistic constraints to serve the needs of the society.
4	Ability to design and conduct experiments, as well as to analyze and interpret data
5	Ability to use appropriate techniques & tools to solve engineering problems.
6	Ability to apply the knowledge to analyze and understand societal, health, safety, legal, and cultural issues relevant to the Information Technology practices.
7	Ability to analyze the local and global impact of computing on individual as well as on society.
8	Ability to demonstrate professional ethical practices and social responsibilities in global and societal contexts.
9	Ability to function effectively as an individual, and as a member or leader in diverse and multidisciplinary teams.
10	Ability to communicate effectively with the engineering community and with society at large
11	Ability to understand engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects.
12	Ability to recognize the need for updating the knowledge in the chosen field and imbibing learning to learn skills.

Course Outcome versus **Program Outcomes:**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO-1	S	S	S	M	M							
CO-2	S	S	M									
CO-3	S	S	M	S	S							
CO-4	S	S	M	S	M		M					
CO-5	S	S	S	M	M							

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

Assessment Methods:	Assignment / Quiz / Mid-Test / End Exam

Teaching-Learning and Evaluation

Week	TOPIC / CONTENTS	Course Outcomes	Sample questions	TEACHING-LEARNING STRATEGY	Assessment Method & Schedule
1	Overview of computer operating systems, computer system organization,computer system architecture, operating systems operations.	CO-1	1.Explain operating system operations	▫ Lecture / Discussion ▫ Demonstration	Quiz (Week-7) Assignment (Week-6 to Week-8) Mid-Test 1
2	protection and security, distributed systems, special purpose systems, operating systems services, systems calls and its types, operating systems structure,operating systems generation.	CO-1	1.Write about operating systems generation	▫ Lecture / Discussion	Quiz (Week-7) Assignment (Week-6 to Week-8) Mid-Test 1
3	Process, Process Control Blocks, Operations on Processes, Interprocess Communication.	CO- 2	1.Define process.Explain operations on process	▫ Lecture/ Discussion	Quiz (Week-7) Assignment (Week-6 to Week-8) Mid-Test 1
4	Scheduling Criteria, scheduling-criteria algorithms(FCFS, SJF, Round Robin, Priority) and their evaluation.	CO-2	1.What is scheduling of criteria?Explain the algoirthm of Round robin scheduling.	▫ Lecture/ Discussion ▫ Problem solving	Quiz (Week-7) Assignment (Week-6 to Week-8) Mid-Test 1
5	Multiprocessor scheduling, Thread scheduling. Case Study: Linux.	CO-2	1.Explain thread scheduling in detail	▫ Lecture/ Discussion ▫ Problem solving	Quiz (Week-7) Assignment (Week-6 to Week-8)

					Mid-Test 1
6	The Critical- section problem, Peterson's Solution,synchronization Hardware, semaphores, classic problems of synchronization.	CO-2	1.What is critical section.List the requirements for satisfying critical section problem.	▫ Lecture/ Discussion	Quiz (Week-7) Assignment (Week-6 to Week-8) Mid-Test 1
7	monitors,Synchronization examples, atomic transactions. Case Study: Linux.	CO-2	1.Disscuss the role of atomic transactions with respect to operating system	▫ Lecture/ Discussion	Quiz (Week-7) Assignment (Week-6 to Week-8) Mid-Test 1
8	Swapping, contiguous memory allocation, paging, structure of the page table, segmentation.	CO- 3	1.what is paging. explain the mechanism of paging	▫ Lecture/ Discussion	Quiz (Week-7) Assignment (Week-6 to Week-8) Mid-Test 1
9	**Mid-Test 1**				
10	Virtual memory, demand paging, Copy on write, page-Replacement algorithms (FIFO, LRU, LFU, Optimal Page Replacement)	CO-3	1.Discuss about LRU algorithm in detail	▫ Lecture/ Discussion Problem solving	Quiz (Week-17) Assignment (Week-15 to Week-17) Mid-Test 2
11	System model, deadlock characterization, Methods for Handling Deadlock, deadlock prevention, detection and Avoidance, recovery form deadlock.	CO-3	1.Explain deadlock and explain various methods for deadlock	▫ Lecture/ Discussion	Quiz (Week-17) Assignment (Week-15 to Week-17) Mid-Test 2
12	I/O Hardware, application interface, kernel I/O subsystem,Transforming I/O requests,Hardware operations,STREAMS,Performance	CO-4	1.Illustrate I/o hardware	▫ Lecture/ Discussion	Quiz (Week-17) Assignment (Week-15 to Week-17) Mid-Test 2
13	File Concept, Access Methods, Directory Structure, File System Mounting.	CO-4	1.Explain directory structure in detail	▫ Lecture/ Discussion	Quiz (Week-17) Assignment (Week-15 to Week-17) Mid-Test 2
14	File system structure, File System Implementation, Directory Implementation, Allocation Methods, Free-space Management, Efficiency and performance, Log-Structured File Systems, Network File Systems.	CO-4	1.Explain free space management in detail	▫ Lecture/ Discussion	Quiz (Week-17) Assignment (Week-15 to Week-17) Mid-Test 2

15	Case Study: Linux, Overview of Mass-storage structure, disk structure, disk attachment, disk scheduling, swap-space management. RAID structure, stable-storage implementation, Tertiary storage structure.	CO-4	1.List different types disk scheduling mechanisms	▫ Lecture/ Discussion	Quiz (Week-17) Assignment (Week-15 to Week-17) Mid-Test 2
16	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.	CO-5	1.Discuss about principles of protection	▫ Lecture/ Discussion	Quiz (Week-17) Assignment (Week-15 to Week-17) Mid-Test 2
17	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	CO-5	1.Explain different types of threats in detail	▫ Lecture/ Discussion	Quiz (Week-17) Assignment (Week-15 to Week-17) Mid-Test 2
18	**Mid-Test 2**				
19/20	**END EXAM**				