Lesson Plan

Name of Faculty : Dr. Sanjay Dahiya, Assistant Professor of CSE
Discipline : Computer Science and Engineering
Semester : VIth (Even)
Subject : Operating Systems / PCC-CSE-305-T
Lesson Plan Duration : 15 weeks (from January/ February-2023 to June/July-2023)
Work Load (Lecture/Practical) per week (in hours): (3-L) hours

Week	Theory		Topic Covered Date and Remarks		
	Lecture-Day	Topic (Including Assignment/Test)	Date	HOD	Director- Principal
1st	1	Introductory Concepts			
	2	Operating systems functions and characteristics			
	3	Operating system services and systems call			
	4	Operating system services and systems call			
2nd	5	System programs			
	6	Operating system structure			
	7	Operating systems generation			
	8	Types of Operating systems: Batch operating system			
3rd	9	Time-sharing OS			
	10	Realtime systems Distributed operating system			
	11	File Systems: Types of Files and their access methods			
	12	File allocation methods			
4th	13	Directory Systems: Structured Organizations,			
	14	Directory and file protection mechanisms,			
	15	Disk scheduling and its associated algorithms.			
	16	Disk scheduling and its associated algorithms.			
5th	17	Processes: Process concept, Process Control Block			
	18	Operations on processes, cooperating processes			
	19	CPU scheduling: Levels of Scheduling			
	20	Scheduling criteria			
6th	21	Comparative study of scheduling algorithms			
	22	Algorithm evaluation			
	23	Multiple processor scheduling.			
	24	Critical-section problem, Semaphores.			
7th		**1st Minor Test**			
8th	25	Storage Management: Storage allocation methods			
	26	Single contiguous allocation			
	27	Non-contiguous memory allocation			
	28	Paging and Segmentation techniques			
9th	29	Segmentation with paging,			
	30	Virtual memory concepts			
	31	Demand Paging			
	32	Page replacement Algorithms			
10th	33	Page replacement Algorithms			
	34	Thrashing			
	35	Revision and Problem Solving			
	36	Revision and Quiz			
11th	37	Deadlock: System model			
	38	Deadlock characterization			
	39	Methods for handling deadlocks			
	40	Revision and Problem Solving			
12th	41	Deadlock prevention			
	42	Deadlock avoidance			
	43	Deadlock detection			
	44	Recovery from deadlock			
13th	45	Case Studies:			
	46	Comparative study of WINDOW			
	47	UNIX & LINUX system			
	48	UNIX & LINUX system			
14th		**2nd Minor Test**			
15th	49	Revision and Problem Solving			
	50	Revision and Quiz			
	51	Revision and Problem Solving			
	52	Revision and Quiz			

Operating Systems PCC-CSE305-T

General Course Information

Course Code: PCC-CSE305-T/ PCC-IT206-T Course Credits: 3 Type: Professional Core Contact Hours: 3 hours/week Mode: Lectures (L) Examination Duration: 3 hours	**Course Assessment Methods (internal: 30; external: 70)** Two minor examinations (20 marks), Class Performance measured through percentage of lectures attended (4 marks), assignments (6 marks), and the end-semester examination (70 marks). For the end semester examination, nine questions are to be set by the examiner. A candidate is required to attempt 5 questions in all. All questions carry equal marks. Question number 1 will be compulsory and based on the entire syllabus. It will contain seven parts of 2 marks each. Question numbers 2 to 9 will be given by setting two questions from each of the four units of the syllabus. A candidate is required to attempt the remaining four questions by selecting one question from each of the four units.

Pre-requisites: programming in C and knowledge of computer fundamentals.

About the Course:
The objective of this course is to help students become familiar with the fundamental concepts of operating systems and provide them with enough understanding of operating system design.

Course Outcomes: By the end of the course students will be able to:

CO1. **List** various functions and design characteristics of operating systems (LOTS: Level 1: Remember)
CO2. **Explain** fundamental concepts of operating systems. (LOTS: Level 2: Understand)
CO3. **Apply** operating system design concepts for solving problems regarding scheduling, memory management, disk management and deadlocks etc. (LOTS: Level 3: Apply)
CO4. **Analyze** the issues related to various operating systems. (HOTS: Level 4: Analyses)
CO5. **Design** solutions for the memory and process management problems. (HOTS: Level 6: Create)

Course Content

Unit I
Introductory Concepts: Operating systems functions and characteristics, operating system services and systems call, system programs, operating system structure. operating systems generation, operating system services and systems call. Types of Operating systems: Batch operating system, Time-sharing OS, Distributed operating system, Realtime systems.
File Systems: Types of Files and their access methods, File allocation methods, Directory Systems: Structured Organizations, directory and file protection mechanisms, disk scheduling and its associated algorithms.

Unit II
Processes: Process concept, Process Control Block, Operations on processes, cooperating processes. CPU scheduling: Levels of Scheduling, scheduling criteria, Comparative study of scheduling algorithms, Algorithm evaluation, multiple processor scheduling. Critical-section problem, Semaphores.

Unit III
Storage Management: Storage allocation methods: Single contiguous allocation, non-contiguous memory allocation, Paging and Segmentation techniques, segmentation with paging, Virtual memory concepts, Demand Paging, Page replacement Algorithms, Thrashing.

Unit IV
Deadlock: System model, Deadlock characterization, Methods for handling deadlocks, Deadlock prevention, Deadlock avoidance, Deadlock detection, Recovery from deadlock
Case Studies: Comparative study of WINDOW, UNIX & LINUX system.

Text and Reference Books:

1. Silberschatz, Peter B. Galvin and Greg Gagne, *Operating System Concepts*, 8th Edition, WileyIndian Edition, 2010.
2. Andrew S Tanenbaum, *Modern Operating Systems,* Third Edition, Prentice Hall India, 2008.
3. Naresh Chauhan, *Principles of Operating Systems,* Oxford Press, 2014.
4. D.M. Dhamdhere, *Operating Systems*, 2nd edition, Tata McGraw Hill, 2010.
5. William Stallings, *Operating Systems– Internals and Design Principles*, 5th Edition, Prentice Hall India, 2000.