**LESSON PLAN**

**Name of faculty: SH. RAVINDER KUMAR, Assistant Professor (CSE)**

**Discipline: Computer Science & Engineering**

**Semester: 4th**

**Subject: OPERATING SYSTEM**

Lesson Plan Duration: 15 weeks (from January, 2018 to April, 2018)

Work Load(Lecture/Practical) per week (in hours): Lectures: 03 Tutorial:01

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| **Week** | **Theory** | |
|  | **Lecture day** | **Topic(Including assignment/ test)** |
| 1st |  | Introduction to OS. Operating system |
|  | Different types of O.S.: batch process, |
|  | Functions multi programmed, time-sharing, |
| 2nd |  | Real-time, distributed, parallel. |
|  | System Structure: Computer system |
|  | I/O structure, |
| 3rd |  | Operation storage structure, storage hierarchy, |
|  | Different types of protections, operating system structure (simple, layered, virtual machine), |
|  | O/S services, system calls. |
| 4th |  | CPU scheduling: scheduling criteria, |
|  | Preemptive & non-preemptive scheduling, |
|  | Scheduling algorithms, algorithm evaluation, |
| 5th |  | Multi-processor scheduling. |
|  | Threads: overview, benefits of threads , |
|  | User and kernel threads. |
| 6th |  | Process Management: Concept of processes, process states, process control |
|  | Co-operating processes, inter-process communication, Process Synchronization: background, critical section problem, critical region |
|  | FIRST SESSIONAL EXAM |
| 7th |  | Synchronization hardware, Classical problems of synchronization, |
|  | Semaphores. |
|  | Deadlocks: Concept of deadlock, deadlock characterization,. |
| 8th |  | Deadlock prevention, deadlock avoidance, |
|  | deadlock detection, |
|  | Recovery from deadlock |
| 9th |  | Memory Management: background |
|  | Logical vs. physical address space, contiguous memory allocation, |
|  | Paging, segmentation, segmentation with paging. |
| 10th |  | Concept of fragmentation. |
|  | Virtual Memory: background, demand paging |
|  | Concept of page replacement, |
| 11th |  | Page replacement algorithms , |
|  | Allocation of frames, thrashing. |
|  | File Systems: file concept, allocation methods |
| 12th |  | File organization and access methods, |
|  | Directory structure, free-space management |
|  | I/O Management: I/O hardware, |
| 13th |  | Polling, interrupts, DMA |
|  | Kernel I/O subsystem  (scheduling, buffering, caching,) |
|  | Spooling and device reservation |
| 14th |  | Disk Management: disk structure, |
|  | Disk scheduling (FCFS, SSTF, SCAN,C-SCAN) , |
|  | Disk reliability, disk Performance parameters |
| 15th |  | Protection & Security: Goals of protection and security, security attacks |
|  | Authentication, program threats, system threats, threat monitoring |
|  | Case studies: UNIX file system, Windows file system |

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| Text Books: | **Principles of Operating Systems** , Naresh Chauhan, Oxford University Press,2014 |
| Reference books: | **Operating System Concepts** , Abraham Silberschatz, Peter Baer Galvin, and Greg Gagne, Wiley |