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| **Academic Plan for 5th Semester** | | | |
| **Operating Systems** | | | |
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| **Lecture** | **Topic** | | **Reference Books** |
| L1, L2 | **INTRODUCTION** | | [T1] [T2] |
| 1.1 | What is an Operating System, Simple Batch Systems | [R2][R3] |
| 1.2 | Multiprogrammed Batches systems |  |
| 1.3 | Time-Sharing Systems |  |
| 1.4 | Personal-computer systems |  |
| 1.5 | Parallel systems |  |
| 1.6 | Distributed Systems |  |
| 1.7 | Real-Time Systems |  |
| 1.8 | OS – A Resource Manager |  |
| L3, L4 | **MEMORY MANAGEMENT** | |  |
| 2.1 | Memory Organization, Memory Hierarchy, Memory Management Strategies | [T1] [T2] |
| 2.2 | Contiguous versus non- Contiguous memory allocation, Partition Management Techniques | [R2][R3] |
| 2.3 | Logical versus Physical Address space,swapping |  |
| L5 | 2.5 | Paging |  |
| L6, L7 | 2.6 | Segmentation |  |
| 2.7 | Segmentation with Paging |  |
| L8, L9 | **VIRTUAL MEMORY** | | [T1] [T2] |
| 3.1 | Demand Paging | [R2][R3] |
| 3.2 | Page Replacement |  |
| 3.3 | Page-replacement Algorithms |  |
| L10 | 3.4 | Performance of Demand Paging |  |
| 3.5 | Allocation of Frames |  |
| 3.6 | Thrashing |  |
| 3.8 | Demand Segmentation and Overlay concepts |  |
| L11, L12, L13,L14 | **PROCESSES** | | [T1][T2][[R3] |
| 4.1 | Introduction, Process states, process management |  |
| 4.2 | Interrupts, Interprocess Communication |  |
| 4.3 | Threads: Introduction, Thread states, Thread Operation, Threading Models. |  |
| L15, L16, L17 | **CPU SCHEDULING** | | [T1][T2][[R3] |
| 5.1 | Scheduling levels, pre emptive vs no pre emptive scheduling,priorities, scheduling objective |  |
| 5.2 | Scheduling Criteria |  |
| 5.3 | Scheduling Algorithms |  |
| L18 | 5.4 | Demand scheduling |  |
| 5.5 | Real-Time Scheduling |  |
| L19, L20, | **PROCESS SYNCHRONIZATION** | | [T1][T2][[R3] |
| 6.1 | Mutual exclusion, software solution to Mutual exclusion problem, |  |
| 6.2 | The Critical-Section Problem |  |
| 6.3 | Synchronization Hardware |  |
| 6.4 | Semaphores |  |
|  | 6.5 | Case study on Dining philosopher problem,Barber shop problem etc. |  |
| L21-L25 | **DEADLOCKS** | | [T1][T2][R1] |
| 7.1 | Examples of deadlock, resource concepts, necessary conditions for deadlock |  |
| 7.2 | Deadlock solution,deadlock prevention, deadlock avoidance with Bankers algorithms |  |
| 7.3 | Deadlock detection, deadlock recovery |  |
| L26-L30 | **DEVICE MANAGEMENT** | | [T1][T2][R1] |
| 8.1 | Disk Scheduling Strategies |  |
| 8.2 | Rotational Optimization, |  |
| 8.3 | System Consideration, |  |
| 8.4 | Caching and Buffering |  |
| L31-L40 | **FILE - SYSTEM INTERFACE** | | [T1] [T2] |
| 9.1 | File System: Introduction, File Organization, | [R4][R5] |
| 9.2 | Logical File System, Physical File System |  |
| 9.3 | File Allocation strategy |  |
| 9.4 | Free Space Management |  |
| 9.5 | File Access Control, Data Access Techniques |  |
| 9.6 | Data Integrity Protection |  |
| 9.7 | Case study on file system viz FAT32, NTFS, Ext2/Ext3 etc. |  |
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| ***Text Books:*** | |  |  |
| [T1] Deitel & Dietel, “Operating System”, Pearson, 3rd Ed., 2011 | | |  |
| [T2] Silbersachatz and Galvin, “Operating System Concepts”, Pearson, 5th Ed., 2001 | | |  |
| [T3] Madnick & Donovan, “Operating System”, TMH,1st Ed., 2001 | | |  |
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| **Reference Books:** | |  |  |
| [R1] Tannenbaum, “Operating Systems”, PHI, 4th Edition, 2000 | | |  |
| [R2] Godbole, “Operating Systems”, Tata McGraw Hill, 3rd edition, 2014 | | |  |
| [R3] Chauhan, “Principles of Operating Systems”, Oxford Uni. Press, 2014 | | |  |
| [R4] Dhamdhere, “Operating Systems”, Tata McGraw Hill, 3rd edition, 2012 | | |  |
| [R5] Loomis, “Data Management & File Structure”, PHI, 2nd Ed. | | |  |