| CLASS: B. Sc (Information technology) | | Semester – III | |
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| **COURSE: Modern Operating Systems** | | | |
| **Periods per week**<br>**1 Period is 50 minutes** | **Lecture** | **5** | |
| | **TW/Tutorial/Practical** | **3** | |
| | | | |
| | | **Hours** | **Marks** |
| **Evaluation System** | **Theory Examination** | **3** | **100** |
| | **TW/Tutorial/Practical** | **--** | **50** |
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| Unit-I | **Introduction to Operating Systems:** OS and Computer System, System performance, Classes of OS, Batch processing, time-sharing, multiprocessing, real time, distributed and modern operating systems, Desktop Systems, Handheld Systems, Clustered Systems, Assemblers, Compilers and Interpreters, Linkers. |
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| Unit-II | **Operating-System Structures:** Operating-System Services, User Operating-System Interface, System Calls, Types of System Calls, System Programs, Operating-System Design and Implementation, Operating-System Structure, Virtual Machines, Operating-System Generation, System Boot. |
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| Unit-III | **Processes and Process Synchronization:** Process Concept, Process Scheduling, Scheduling Criteria, Scheduling Algorithms, Operations on Processes, Interprocess Communication, Multithreading Models, Threading Issues, Thread Scheduling, Communication in Client–Server Systems, The Critical-Section Problem, Peterson's Solution, Semaphores. |
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| Unit-IV | **Memory Management:** Memory management without swapping or paging; Swapping, Virtual Memory, Page replacement algorithms, Modeling paging algorithms, Design issues for paging systems, segmentation |
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| Unit-V | **File-System Interface and Implementation:** File Concept, File-System Mounting, Free-SpaceManagement, File Sharing, NFS. **Mass-Storage Structure:** Disk Structure, Disk Management, Swap-Space Management, RAID Structure, Stable-Storage Implementation. Deadlocks , Deadlock detection and recovery, avoidance and prevention |
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| Unit-VI | **I/O Systems:** Application I/O Interface, Transforming I/O Requests to Hardware Operations, STREAMS, Performance.<br>**Protection and Security:** Principles of Protection, Domain of Protection, Access Matrix, Access Control, Capability-Based Systems, Language-Based Protection, The Security Problem, System and Network Threats, Implementing Security Defenses. |

**Books:**
*Modern Operating Systems*, Andrew Tanenbaum,
*Operating Systems*, 2nd Edition, K. A.Sumitra Devi and N.P Banashree, SPD
*Operating System Concepts*, 8th Edition, Abraham Silberschatz, Peter B.Galvin, Greg Gagne, Wiley publication

**Reference:**
*Operating Systems- A concept based approach* , 2nd Edition, D.M. Dhamdhere, McGrawHill publications
*Operating Systems,* 3rd Edition , Godbole and Kahate, McGrawHill publications.

**Term Work:** Should contain at least 6 assignments (one per unit) covering the syllabus.

**Tutorial:** At least **t**hree tutorials based on above syllabus must be conducted.

**Case Studies (Suggested):**

a) MS-DOS
b) Windows NT
c) Windows 2008 Server
d) Windows 7
e) Unix
f) Linux
g) OS/2
h) MAC OS
i) Symbian
j) Chrome
k) Android