

Andhra Pradesh State Council of Higher Education
M.Sc. Computer Science Syllabus

MCS 203-OPERATING SYSTEMS

UNIT-I:

Introduction : What Operating Systems Do – Computer System Organization – Computer system Architecture – Operating System Structure – Operating System Operations – Process Management –Memory Management – Storage Management – Protection and Security –Distributed Systems – Special purpose Systems – Computing Environments.

System Structure: Operating System Services – User Operating System Interface – System Calls – Types of System Calls – System Programs –Operating System Design and Implementation – Operating System Structure – Virtual Machine – Operating System Generation – System Boot.

Process Concept : Overview – Process Scheduling – Operations on Processes – Inter process Communication – Examples of IPC Systems – Communication in Client Server Systems.

UNIT-II:

Multithreaded Programming : Overview – Multithreading Models –Thread Libraries – Threading Issues – Operating System Examples.

Process Scheduling: Basic Concepts – Scheduling Criteria –Scheduling Algorithms – Multiple Processor Scheduling – Thread Scheduling.

Synchronization: Background – The Critical Section Problem –Peterson’s solution – Synchronization Hardware – Semaphores – Classic Problem of Synchronization – Monitors – Synchronization Examples – Atomic Transaction.

UNIT-III:

Deadlocks : System Model – Deadlock Characterization – Methods for Handling Deadlocks – Deadlock Preventio – Deadlock Avoidance –Deadlock Detection – Recovery from Deadlock.

Memory Management Strategies: Background – Swapping – Contiguous Memory Allocation – Paging – Structure of the Page Table –Segmentation – Example: The Intel Pentium.

Virtual Memory Management: Background – Demand Paging – Copy on Write – Page Replacement – Allocation of Frames – Thrashing.

UNIT-IV:

File System : File Concept – Access Methods – Directory Structure – File SystemMounting – File Sharing – Protection.

Implementing File Systems :File System Structure – File System Implementation – Directory Implementation – Allocation Methods –Free Space Management – Efficiency and Performance – Recovery – Log structured File Systems.

Secondary Storage Structure : Overview of Mass – Storage Structure –Disk Structure – Disk Attachment – Disk Scheduling – Disk Management– Swap Space Management – RAID structure.

I/O Systems: Overview – I/O Hardware – Application I/O Interface- Kernal I/O Interface – Transforming I/O requests to Hardware Operations – Streams – Performance.

Prescribed Book:

Abraham Silberschatz, Peter Baer Galvin, Greg Gagne.

“Operating System Principles”, Seventh Edition, Wiley.

Chapters: 1.1 – 1.12, 2.1 – 2.10, 3.1 – 3.6, 4.1 – 4.5, 5.1 – 5.5, 6.1 – 6.9 , 7.1 – 7.7 , 8.1 – 8.7,

9.1 – 9.6, 10.1 – 10.6, 11.1 – 11.8, 12.1 – 12.7,13.1 – 13.7

Reference Book:

1. William Stallings, “Operating Systems – Internals and Design Principles”, Fifth Edition, Pearson Education (2007)
2. Achyut S Godbole, “Operating Systems”, Second Edition, TMH (2007).
3. Flynn/McHoes, “Operating Systems”, Cengage Learning (2008).
4. Deitel & Deitel, “Operating Systems”,Third Edition, Pearson Education (2008).