

Operating System Concepts (IT-4002)

Course Code	IT-4002	Credits-4	L – 3, T-1, P-0
Name of the Course	Operating System Concepts		
Lectures to be Delivered	52 (1 Hr Each) (L= 39, T = 13 for each semester)		
Semester End Examination	<i>Max. Marks: 100</i>	<i>Min. Pass Marks: 40</i>	Maximum Time:3hrs
Continuous Assessment (based on sessional tests (2) 50%, Tutorials/Assignments 30%, Quiz/Seminar 10%, Attendance 10%)			<i>Max. Marks: 50</i>

Instructions

- For Paper Setters:** The question paper will consist of five sections A, B, C, D, and E. Section E will be Compulsory, it will consist of a single question with 10-20 subparts of short answer type, which will cover the entire syllabus and will carry 40% of the total marks of the semester end examination for the course. Section A, B, C and D will have two questions from the respective sections of the syllabus and each section will carry 15% of the total marks of the semester end examination for the course.
- For Candidates:** Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C and D of the question paper and all the subparts of the questions in section E. Use of non-programmable calculators is allowed.

Section – A

What is an Operating system? Simple Batch Systems; Multiprogrammed Batched Systems; Time-Sharing Systems; Personal-Computer Systems; Parallel Systems; Distributed Systems; Real-Time Systems. System Components; Operating-System Services; System Calls, System Programs; System Structure; Virtual machines. Process Concept; Process Scheduling; Operation on processes, Cooperating Processes, Threads, Interprocess Communication

CPU Scheduling fundamental Concepts, Scheduling Criteria; Scheduling Algorithms; Multi-processor Scheduling; Real-Time Scheduling.

Section – B

Deadlocks: System Model; Deadlock Characterization; Methods of Handling Deadlocks; Deadlock Prevention; Deadlock Avoidance; Deadlock Detection; Recovery from deadlock; Combined Approach to Deadlock Handling. Protection: Goals of protection; Domain of protection; Access Matrix and its implementation; Revocation of Access Rights; Capability-Based Systems; Language-Based protection.

Security: The Security problem; Authentication; One-Time passwords; program Threats; System Threats; Threat Monitoring; Encryption and decryption; Computer-Security Classifications; An Example Security Model: Windows NT.

Section – C

Memory Management: Logical versus Physical Address Space; Swapping; Contiguous Allocation; paging; Segmentation; Segmentation with Paging.

Virtual Memory: Demand paging; Performance of Demand Paging; page Replacement; Page Replacement Algorithms; Allocation of Frames; Thrashing; Other Considerations; Demand Segmentation. Cache memory and implementation.

Secondary-Storage Structure: Disk Structure; Disk Scheduling; Disk Management; Swap-Space management; Disk Reliability; Stable-Storage Implementation.

Section – D

File-System Interface: File Concept; Access Methods; Directory Structure; Protection; Consistency Semantics. File-System Implementation: File-System Structure; Allocation Methods; Free-Space Management; Directory Implementation ; Efficiency and Performance; Recovery.

BOOKS:

1. Abraham Silberschatz, Peter Baer Galvin, "Operating system Concepts", John Wiley & Sons, Inc., Vth Edition, 2000.
2. Deital H.M., "An Introduction to Operating systems", Addison Wesley Publishing Co., 1984.