Computer Science paper-I
Operating Systems–II
[Discipline Specific Course]

Semester: VI	Credits: 02	Subject Code: BS62201	Lectures: 36

Course Outcomes:

At the end of this course, the learner will be able to:
- Learn the issue of Deadlocks in Process management and apply different algorithms/techniques to handle the deadlocks.
- Explore the concept of File system management
- Describe the disk structure and compare various disk scheduling algorithms.
- Analyze the design and functioning of distributed operating systems and mobile operating system

Unit 1: Process Deadlocks	12

- System model
- Deadlock Characterization
  - Necessary conditions, Resource allocation graph
- Deadlock Prevention
- Deadlock Avoidance
  - Safe state, Resource allocation graph algorithm, Banker's Algorithm
- Deadlock Detection
- Recovery from Deadlock
  - Process termination, Resource preemption

Unit 2: File system Management & Disk scheduling	10

- File concept
- Access Methods
  - Sequential, Direct, Other access methods
- Directory and Disk Structure
  - Storage structure, Directory overview, Single level directory, Two level directory, Tree structure directory, Acyclic graph directory, General graph directory
- Allocation Methods
  - Contiguous allocation, Linked allocation, Indexed allocation
- Free Space Management
  - Bit vector, Linked list, Grouping, Counting, Space maps

Disk scheduling
- Overview & Disk Structure
- Disk Scheduling -
- FCFS Scheduling, SSTF Scheduling,

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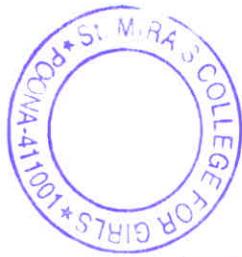
Scan Scheduling-Scan Scheduling, Look Scheduling
- Disk Management
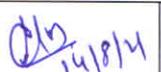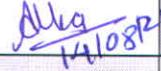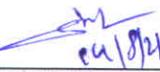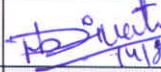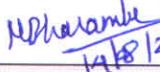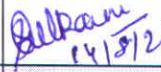
Unit 3: Introduction to Distributed operating systems & Architecture	8
- What is a distributed system, Design goals - Types of distributed systems - Architectural styles : Layered architectures , Object-based architectures, Resource-centered architectures - System architecture –Centralized organization, Decentralized organizations, peer-to-peer systems, Hybrid architectures - Example architectures: Network file system (NFS),Web-based distributed systems	

Unit 4: Mobile Operating Systems	6
- Introduction - Features - Special Constraints and Requirements of Mobile Operating System - Special Service Requirements - ARM & Intel architectures–Power management - Mobile OS architectures - Underlying OS, kernel structure & native level programming, Runtime issues, Approaches to power management - Commercial Mobile Operating Systems - Windows Mobile, iPhone OS(iOS),Android - Comparative Study of Mobile Operating Systems(PalmOS,Android, SymbianOS,BlackberryOS, AppleiOS)	

Recommended Reference Books:

- A. Tannenbum, Herbert Bos, "Modern Operating systems", Pearson Publication, 4 th Edition
- Avi Silberschatz, Peter Galvin, Greg Gagne, Operating System Concepts, Student Edition, Wiley Asia
- M Singhal and NG Shivaratri, *Advanced Concepts in Operating Systems*, Tata McGraw Hill Inc, 2001 (Text Book)
- Pradeep K. Sinha, *Distributed Operating Systems Concepts and Design,* PHI
- Prasant Kumar Pattnaik, Rajib Mall, *"Fundamentals of Mobile Computing"*, PHI Learning Pvt.Ltd, New Delhi – 2012.
- William Stallings *Operating Systems: Internals and Design Principle*, Prentice Hall of India

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Subject Expert (Outside SPPU)	Dr. Manisha Divate	*signature* 14/8/24	
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