OUTCOMES:

Upon completion of the course, the student will be able to

- Judge the emerging wireless technology standards.
- Configure functionalities of router and switches.
- Assess the importance of wireless adhoc networks.
- Compare and contrast various wireless technologies.
- Explain and design the considerations for deploying wireless network infrastructure.

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CP5251 **ADVANCED OPERATING SYSTEMS** **L T P C**
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OBJECTIVES:

- To understand the concepts of distributed systems.
- To get an insight into the various issues and solutions in distributed operating systems.
- To learn about real-time operating systems.
- To gain knowledge on the design concepts of mobile operating systems.
- To understand cloud operating systems.

UNIT I   INTRODUCTION   9
Distributed Operating Systems – Issues – Communication Primitives – Limitations of a Distributed System – Lamport's Logical Clocks – Vector Clocks – Causal Ordering of Messages

UNIT II   DISTRIBUTED OPERATING SYSTEMS   9
Distributed Mutual Exclusion Algorithms – Classification – Preliminaries – Simple Solution – Lamport's Algorithm – Ricart-Agrawala Algorithm – Suzuki-Kasami's Broadcast Algorithm – Raymond's Tree-Based Algorithm – Distributed Deadlock Detection – Preliminaries – Centralized Deadlock Detection Algorithms – Distributed Deadlock Detection Algorithms – Path Pushing Algorithm – Edge Chasing Algorithm – Hierarchical Deadlock Detection Algorithms – Agreement Protocols – Classification – Solutions to the Byzantine Agreement Problem – Lamport-Shostak-Pease Algorithm

UNIT III   DISTRIBUTED RESOURCE MANAGEMENT   9
Distributed File Systems – Design Issues – Google File System – Hadoop Distributed File System – Distributed Shared Memory – Algorithms for Implementing Distributed Shared Memory – Load Distributing Algorithms – Synchronous and Asynchronous Check Pointing and Recovery – Fault Tolerance – Two-Phase Commit Protocol – Nonblocking Commit Protocol

UNIT IV   REAL TIME OPERATING SYSTEMS   9
Basic Model of Real - Time Systems – Characteristics – Application of Real - Time Systems – Real - Time Task Scheduling – Handling Resource Sharing

UNIT V   MOBILE AND CLOUD OPERATING SYSTEMS   9
Android – Overall Architecture – Linux Kernel – Hardware Support – Native User-Space – Dalvik and Android's Java – System Services – Introduction to Cloud Operating Systems.

TOTAL: 45 PERIODS

OUTCOMES:
Upon completion of the course, the students will be able to
- Identify the features of distributed operating systems.
- Demonstrate the various protocols of distributed operating systems.
- Identify the different features of real time operating systems.
- Discuss the features of mobile operating systems.
- Discuss the features of cloud operating systems.

REFERENCES:
1. Mukesh Singhal and Niranjan G. Shivaratri, "Advanced Concepts in Operating Systems – Distributed, Database and Multiprocessor Operating Systems", Tata MC Graw-Hill, 2001.
2. Rajib Mall, "Real-Time Systems: Theory and Practice", Pearson Education India, 2006.
3. Karim Yaghmour, "Embedded Android", O'Reilly, First Edition, 2013.
4. Nikolay Elenkov, "Android Security Internals: An In-Depth Guide to Android's Security Architecture", No Starch Press, 2014.

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