



## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### AD HOC WIRELESS NETWORKS

150711 (DE)

#### COURSE OBJECTIVES

- Recognize needs of different set of MAC, routing and transport protocols for wireless computer networks compared to wired networks.
- Understand and Compare different types of MAC, Routing and Transport protocols for Ad hoc Networks.
- Analyze performance of MANET Routing Protocols under different mobility patterns.
- Identify different methods for energy saving in a mobile device.
- Identify future research directions.

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#### Unit-I:

**Introduction-** Wireless Networks, Cellular Mobile Network, Wireless LAN, Ad Hoc Networks, Sensor Network, Differences between Cellular and Ad Hoc, Issues in Ad Hoc Wireless Networks, Applications of Ad Hoc Wireless Networks.

#### Unit-II

**MAC Layer**–Introduction, Issues and Need for Medium Access Control. Problems in Ad Hoc Channel Access such as Hidden Terminal Problem and Exposed Node Problem. Classification of MAC Protocols – Contention Based MAC Protocols such as ALOHA and CSMA, Contention-Based MAC Protocols with Reservation Mechanisms such as MACA and MACA-BI.

#### UNIT-III

**Routing Protocols-** Introduction, Classification of Routing Protocols- Proactive routing protocols such as WRP and DSDV, Reactive routing protocol such as AODV, DSR , LAR, Hybrid Routing protocols such as ZRP.

#### UNIT-IV

**Transport Protocols and Energy Management Systems** – Introduction, Design Issues and Challenges, Power Management, Smart Batteries and Battery Characteristics.



## UNIT-V

**Security-** Security in wireless Ad hoc wireless Networks, Network security requirements, Issues & challenges in security provisioning, Security attacks.

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### RECOMMENDED BOOKS

- Ad Hoc Wireless Networks: Architectures and Protocols, C. Siva Ram Murthy, B. S. Manoj, Pearson Education India
- Ad Hoc Mobile Wireless Networks: Protocols and Systems, C.-K. Toh Pearson Publication.
- Wireless Networks Principles, Protocols, and Applications: Subir Kumar Sarkar, T G Basavaraju, C Puttamadappa, Auerbach Publications, Taylor & Francis Group
- Security and Quality of Service in Ad Hoc Wireless Networks, Amitabh Mishra, John Wiley & Sons, Cambridge University Press

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### COURSE OUTCOMES

After completion of this course, the students would be able to:

- CO1. **Outlines** the basics of wireless networks
- CO2. **Identify** various issues/problems associated with Ad-hoc networks and their Solutions.
- CO3. **Examine** the working of various Ad-hoc network protocols
- CO4. **Analyse** the performance of various Ad-hoc network protocols
- CO5. **Develop** the solutions of various problems/Issues associated with ad-hoc Networks

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### Course Articulation Matrix

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	1	1	1				1			1				
CO2	1	2	2	3	3	1			2					
CO3	1	2	2	3	2		1	2		1				3
CO4		2	1	2			1						3	
CO5	1	2	1		3				2		2		3	3

1 - Slightly; 2 - Moderately; 3 – Substantially



## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### DATA MINING & WAREHOUSING

#### 150712 (DE)

#### COURSE OBJECTIVES:

- To understand the value of data mining in solving real-world problems.
- To gain understanding of algorithms commonly used in data mining tools.
- To develop ability for applying data mining tools to real-world problems

#### UNIT-1:

Introduction: Motivation: Important, Data type for Data Mining: Relational Databases Data Ware-Houses. Transactional Databases, Advanced Database System and Its Applications, Data Mining Functionalities Concept/Class Description, Association Analysis Classification & Prediction, Cluster Analysis, Outliner Analysis Classification of Data Mining Systems, Major Issues in Data Mining

#### UNIT-2:

Data Warehouse and OLTP Technology for Data Mining: Differences between Operational Database Systems & Data Warehouse, Multidimensional Data Model, Data Warehouse Architecture, Data Warehouse Implementation, Data Cube Technology, Emerging Scenario of Pattern Warehousing System

#### UNIT -3:

Data Pre-processing: Data Cleaning, Data Integration and Transformation, Data Reduction Discretization and Concept Hierarchy Generation. Data Mining Primitives Languages and System Architectures, Concept Description, Characterization and Comparison Analytical Characterization.

#### UNIT-4:

Mining Association Rules in Large Databases: Association Rule Mining Market Basket Analysis, Basic Concepts, Mining Single Dimensional Boolean Association Rules from Transactional Databases: The Apriori Algorithm, Generating Association Rules from Frequent Items, Improving the Efficiency of Apriori, other Algorithms & their Comparison, Mining Multilevel Association Rules, Multidimensional Association Rules, Constraint Based Association Rule Mining.

#### UNIT -5:

Classification & Predication and Cluster Analysis: Issues Regarding Classification & Predication, Different Classification Methods, Predication, Cluster Analysis, Major Clustering Methods, Currently Available Tools, Case Study.



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## RECOMMENDED BOOKS

- Data Mining: Concepts and Techniques, Han and Kamber, Morgan Kaufmann Publications.
  - Data Mining Techniques, A. K. Pujari, Universities Press Pvt. Ltd .
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## COURSE OUTCOMES:

After completion of this course, the students would be able to:

- CO 1. **Classify** various databases systems and data models of data warehouse.
- CO2. **Compare** various methods for storing & retrieving data from different data sources/repository.
- CO3. **Apply** pre-processing techniques for construction of data warehouse.
- CO4. **Analyze** data mining for knowledge discovery & prediction.
- CO5. **Explain** data mining methods for identification of association for transactional databases.
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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	3	3	3	2	2	2	1	1	1	1	1	3	3
CO2	3	3	3	2	1	2	2	1	1	1	1	1	3	3
CO3	3	3	3	2	1	2	1	1	1	1	2	1	3	2
CO4	3	3	2	3	1	2	1	1	1	1	1	1	3	2
CO5	2	3	2	2	1	1	1	1	1	1	1	2	3	3

1 - Slightly; 2 - Moderately; 3 – Substantially



## DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

### DISTRIBUTED SYSTEMS

150713 (DE)

#### COURSE OBJECTIVES

- To provide students contemporary knowledge of distributed systems.
  - To equip students with skills to analyze and design distributed applications.
  - To gain experience in the design and testing of a large software system, and to be able to communicate that design to others.
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#### Unit - I

**Introduction to Distributed Systems:** Architecture for Distributed System, Goals of Distributed System, Hardware and Software Concepts, Distributed Computing Model, Advantages & Disadvantage Distributed System, Issues in Designing Distributed System.

#### Unit -II

**Distributed Share Memory:** Basic Concept of Distributed Share Memory (DSM), DSM Architecture & Its Types, Design & Implementations Issues in DSM System, Structure of Share Memory Space, Consistency Model and Thrashing.

**Distributed File System:** Desirable Features of Good Distributed File System, File Model, File Service Architecture, File Accessing Model, File Sharing Semantics, File Catching Scheme, File Application & Fault Tolerance.

#### Unit - III

**Inter Process Communication and Synchronization:** Data Representation & Marshaling, Group Communication, Client Server Communication, RPC-Implementing RPC Mechanism, Stub Generation, RPC Messages. Synchronization: - Clock Synchronization, Mutual Exclusion, Election Algorithms - Bully & Ring Algorithms.

#### Unit - IV

**Distributed Scheduling and Deadlock** Distributed Scheduling- Issues in Load Distributing, Components for Load Distributing Algorithms, Different Types of Load Distributing Algorithms, Task Migration and its issues. **Deadlock-** Issues in deadlock detection & Resolutions, Deadlock Handling Strategy, Distributed Deadlock Algorithms.



## Unit – V

### Distributed Databases and Multimedia Management System

Distributed Data Base Management System (DDBMS), Types of Distributed Database, and Distributed Multimedia: - Characteristics of multimedia Data, Quality of Service Managements. Case Study of Distributed System: - Amoeba, Mach, Chorus

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### RECOMMENDED BOOKS

- Distributed Operating System Concept & Design, Sinha, PHI .
- Distributed System Concepts and Design, Coulouris & Dollimore, Pearson Pub.
- Distributed Operating System, Andrew S. Tanenbaum, Pearson.

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### COURSE OUTCOMES

After completion of this course, the students would be able to:

- CO1. **Tell** the basic elements and concepts related to distributed system Technologies.  
CO2. **Demonstrate** knowledge of the core architectural aspects of distributed systems.  
CO3. **Identify** how the resources in a distributed system are managed by algorithm.  
CO4. **Examine** the concept of distributed file system and distributed shared memory.  
CO5. **Compare** various distributed system algorithms for solving real world problems.

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CO1	3	2	1			1							3	1
CO2	3	2	2	1									3	2
CO3	3	3	2	1			1						3	2
CO4	3	2	3	2	2	1	1		2	1		2	3	2
CO5	3	2	2			1							3	2

1 - Slightly; 2 - Moderately; 3 – Substantially