



MARRI LAXMAN REDDY INSTITUTE OF TECHNOLOGY AND MANAGEMENT

(AN AUTONOMOUS INSTITUTION)

(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)

Accredited by NAAC with 'A' Grade & Recognized Under Section 2(f) & 12(B) of the UGC act, 1956

COURSE CONTENT

Mobile Computing											
VIII Semester: CSE											
Course Code	Category	Hours / Week			Credits				Maximum Marks		
		L	T	P	C	CIA	SEE	Total			
24X0534	PE										
		3	0	0	3	40	60	100			
Contact Classes: 48	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 48						
Prerequisites: Computer Networks											

Course Overview:

This course introduces the fundamentals of Mobile Computing, covering mobile communications, wireless networks, transport protocols, database issues, data dissemination, and Mobile Ad hoc Networks (MANETs). Students learn about GSM, mobile IP, MAC protocols, transport layer adaptations, data synchronization, and routing algorithms in MANETs. The course prepares students to design and implement mobile computing solutions considering mobility, limited resources, and quality of service

Course Objectives:

1. To understand the fundamentals of mobile computing, its architecture, limitations, and GSM-based mobile communication technologies.
2. To analyze medium access control mechanisms and network layer protocols for mobility management and seamless data delivery.
3. To study transport layer adaptations for mobile networks and explore database management challenges such as caching, transactions, and recovery.
4. To examine mechanisms for efficient data dissemination and synchronization in mobile environments.
5. To understand the concepts, challenges, and routing strategies in mobile ad-hoc networks.

Course Outcomes: After Completion of the Course, Students should be able to

1. Understand Multiplexing and MAC Protocols
2. Learn basics of mobile telecommunication systems.
3. Apply functionality of MAC, network layer and identify a routing protocol for a given Ad hoc network.
4. Analyze the functionality of Transport and Application layers.
5. Develop a mobile application using android/blackberry/ios/Windows SDK

UNIT-I

Introduction

Mobile Communications, Mobile Computing – Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices.

GSM – Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS, CSHSD, DECT.

UNIT-II (Wireless)

Medium Access Control (MAC)

Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA,

FDMA, TDMA, CDMA, Wireless LAN/(IEEE 802.11)

Mobile Network Layer

IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management,

Registration, Tunneling and Encapsulation, Route Optimization, DHCP.

UNIT-III

Mobile Transport Layer

Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks.

Database Issues

Database Hoarding & Caching Techniques, Client-Server Computing & Adaptation, Transactional

Models, Query processing, Data Recovery Process & QoS Issues.

UNIT-IV

Data Dissemination and Synchronization

Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination, Broadcast Models, Selective Tuning and Indexing Methods, Data Synchronization – Introduction, Software, and Protocols

UNIT-V

Mobile Ad hoc Networks (MANETs)

Introduction, Applications & Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV, Mobile Agents, Service Discovery.

TEXT BOOKS:

1. Jochen Schiller, “Mobile Communications”, Addison-Wesley, Second Edition, 2009.
2. Raj Kamal, “Mobile Computing”, Oxford University Press, 2007, ISBN: 0195686772

REFERENCE BOOKS:

1. Asoke K Talukder, Hasan Ahmed, Roopa Yavagal Mobile Computing: Technology, Applications and Service Creation, McGraw Hill Education.

ELECTRONIC RESOURCES:

1. <https://www.geeksforgeeks.org/mobile-computing-introduction/>
2. https://www.iitg.ac.in/rkbc/CS421_Mobile_Computing_Notes.pdf
3. <https://www.geeksforgeeks.org/gsm-global-system-for-mobile-communication/>

MATERIALS ONLINE:

1. Course template
2. Tutorial question bank
3. Tech talk and Concept Video topics
4. Open-ended experiments
5. Definitions and terminology
6. Assignments
7. Model question paper – I
8. Model question paper – II
9. Lecture notes
10. E-Learning Readiness Videos (ELRV)