



# INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal - 500 043, Hyderabad, Telangana

## COURSE CONTENT

MOBILE COMPUTING								
V Semester: CSE								
Course Code	Category	Hours/Week			Credits	Maximum Marks		
ACDD09	Elective	L	T	P	C	CIA	SEE	Total
		3	0	0	3	40	60	100
Contact Classes: 48	Tutorial Classes: Nil	Practical Classes: Nil				Total Classes: 48		
Prerequisite: Computer Networks								

### I. COURSE OVERVIEW:

The course provides Overall, the course appears to provide a comprehensive understanding of cloud computing concepts, architectures, major service providers, and practical skills for deploying applications on these platforms. It covers a range of topics from basic concepts to hands-on tutorials for using specific cloud services provided by AWS, Azure, and Google Cloud.

### II. COURSE OBJECTIVES:

#### The students will try to learn:

- I The foundational knowledge of mobile computing concepts, including wireless communication technologies, GSM architecture, and handheld device limitations.
- II The mobile networking protocols at different layers (MAC, Network, Transport) with a focus on mobility management, routing, and data delivery mechanisms.
- III The modern mobile platforms, synchronization protocols, data management techniques, and mobile application environments such as Android, WAP, and Bluetooth.

### III. COURSE OUTCOMES:

#### At the end of the course students should be able to:

- CO 1 Describe the concepts, architecture, and limitations of mobile computing systems, including GSM and GPRS technologies.
- CO 2 Analyze various Medium Access Control (MAC) mechanisms such as FDMA, TDMA, CDMA, and their application in wireless communication.
- CO 3 Demonstrate an understanding of Mobile IP, handover management, location registration, and routing in mobile network environments.
- CO 4 Compare traditional TCP/IP with mobile transport protocols and explain data management strategies like hoarding, caching, and mobile transaction handling.
- CO 5 Evaluate data dissemination methods, synchronization techniques, and broadcasting models in mobile computing systems.
- CO 6 Examine the working of Mobile Ad hoc Networks (MANETs), mobile agents, and mobile platforms such as Android, Symbian OS, and Windows CE.

#### IV. COURSE CONTENT:

##### MODULE-1: INTRODUCTION

**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.

##### MODULE-2: 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)

##### MODULE-3: MOBILE NETWORK LAYER

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

Registration, Tunnelling and Encapsulation, Route Optimization, DHCP.

##### MODULE-4: 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.

##### MODULE-5: 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. Mobile Ad hoc Networks (MANETs): Introduction, Applications & Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV, etc., Mobile Agents, Service Discovery.

Protocols and Platforms for Mobile Computing: WAP, Bluetooth, XML, J2ME, Java Card, Palm OS, Windows CE, Symbian OS, Linux for Mobile Devices, Android.

#### V. TEXT BOOKS:

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

#### VI. REFERENCE BOOKS:

1. Asoke K Talukder, Hasan Ahmed, Roopa R Yavagal, “*Mobile Computing, Technology Applications, and Service Creation*”, 2<sup>nd</sup> Edition, McGraw Hill.
2. UWE Hansmann, Lothar Merk, Martin S. Nocklous, Thomas Stober, “*Principles of Mobile Computing*,” 2nd Edition, Springer.

#### VII. ELECTRONICS RESOURCES:

1. <https://www.coursera.org/specializations/mobile-computing>
2. <https://www.amazon.com/Mobile-Computing-Practical-Raj-Kamal/dp/0195671475>
3. <https://ieeexplore.ieee.org/Xplore/home.jsp>
4. <https://developer.apple.com/documentation/>

#### VIII. MATERIAL ONLINE:

1. Course template
2. Tutorial question bank
3. Tech-talk 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. PowerPoint presentation
11. E-Learning Readiness Videos (ELRV)