4/4 B.Tech. FIRST SEMESTER
MOBILE COMPUTING

CS7T5C **Credits: 4**

(Common to CSE/IT)
Elective - II

Lecture: 4 periods/week **Internal assessment: 30 marks**
Tutorial: 1 period /week **Semester end examination: 70 marks**

Course Context and Overview: This course introduces the fundamental concepts of Mobile Computing. With this foundation students can gain knowledge on wireless LANs, cellular systems, and sensor networks and revisit the design of the various layers of the networking stack in the context of wireless communication.

Prerequisites: C LANGUAGE, I/O ANALOG AND DIGITAL INTERFACING, AND PERIPHERALS

Learning Outcomes:

Ability to:

1. Understand fundamental concepts, principles and mobile devices and systems.
2. Demonstrate GSM and other 2G architectures.
3. Choose different multiplexing concepts for suitable 3G and 4G communication wireless medium access control.
4. Discuss mobile TCP/IP and MANET functionality for packet management and delivery.
5. Discuss the latest trends in wireless communications like IEEE 802.11, WAP, WDP and WTLS.

UNIT I

Introduction: Mobile Communications: An overview –Novel applications, limitations ofMobile Computing, Mobile Devices, Mobile Computing architecture: Mobile computing Architectural layers, Protocols.

UNIT II

Mobile devices and system: Cellular networks and frequency reuse, mobile smart phones,smart mobiles and systems, handheld pocket computers, handheld devices, smart systems, Limitations of mobile devices.

UNIT III

GSM and other 2G Architecture: GSM- Mobile services, System architecture, Radiointerface of GSM, Protocols of GSM, Localization, call handling, Handover GPRS system architecture.

UNIT IV

Wireless Medium Access Control, 3G and 4G communication: Controlling the mediumaccess, Spread spectrum, coding methods, FHSS, CDMA, OFDM, HSPA 3G network, WiMax IEEE 802.16e, Broadband wireless access, 4G networks.

UNIT V

Mobile Network Layer: IP and Mobile IP network layer: OSI layer functions, TCP/IP andInternet protocol, Mobile internet protocol, Packet delivery and Handover management, Location management, agent discovery, Tunneling and Encapsulation, DHCP, Mobile TCP.

UNIT VI

Synchronization: Synchronization in mobile computing systems, Usage models forSynchronization in mobile application, Domain-dependent specific rules for data synchronization, Mobile Agent.

UNIT VII

Mobile Ad hoc Networks (MANETs): Fixed infrastructure architecture and MANETinfrastructure architecture, Properties of a MANET, Spectrum, Applications, Security in Ad-hoc networks, Wireless Sensor Networks.

UNIT VIII

Mobile Wireless Shot Range Networks and Mobile Internet: Wireless networking andwireless LAN, Wireless LAN Architecture, IEEE 802.11 Protocol Layer, Wireless Application Protocol WAP 1.1 Architecture, Wireless Datagram Protocol (WDP), Wireless Transport Layer Security (WTLS), Wireless Transaction and Session Layers, Wireless Application Environment.

Learning Resources

Text Books:

1. Mobile Computing**,**Raj Kamal,2nd Edition Oxford University Press**.**

Reference Books:

1. Mobile Communications, Jochen Schiller, Addison-Wesley, 2nd edition,

2..Mobile computing, Technology Application and service Creation, Asoke K.Talukde,Hasan Ahmed Oopa Yavagai Second Edition, 2nd Edition , MC Graw Hill.