4/4 B.Tech - FIRST SEMESTER

IT7T3 **MOBILE COMPUTING** **Credits:3**

Lecture: 3 Periods/week **Internal assessment: 30 marks**

Practice/Interaction: 1Period/week **Semester end examination: 70 marks**

Objectives:

- To demonstrate the various architecture and applications of Mobile Communication.
- To provide basic knowledge on GSM architecture and CDMA.
- To gain the knowledge on network and transport layers in mobile computing architecture.
- To provide Basic knowledge on MANET's and WLAN.

Outcomes:

Students will be able to

- Understand the architecture of mobile computing and GSM system.
- Understand the services provided by various layers in mobile computing architecture.
- Analyze the concepts of synchronization in mobile computing systems.
- Describe the MANET architecture, applications and properties.
- Know the concepts of Mobile internet using WLAN.

Prerequisite:

Data Communication and Computer Networks.

Syllabus:

UNIT-I

Introduction to Mobile Communications and Computing: Mobile Computing (MC): Introduction to MC, novel applications, limitations, and architecture.

GSM: Mobile services, System architecture, Radio interface, Protocols, Localization and calling, Handover, Security, and New data services.

(Wireless) Medium Access Control: Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA.

UNIT - II

Mobile Network Layer: Mobile IP (Goals, assumptions, entities and terminology, IP packet delivery, agent advertisement and discovery, registration, tunnelling and encapsulation, optimizations), Dynamic Host Configuration Protocol (DHCP).

Mobile Transport Layer : Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/ fast recovery, Transmission /time-out freezing, Selective retransmission, Transaction oriented TCP.

UNIT - III

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

UNIT - IV

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

UNIT - V

Mobile Wireless Shot Range Networks and Mobile Internet: Wireless networking and wireless 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. Case Study on Mobile Operating Systems.

Text Books:

1. Jochen Schiller, “Mobile Communications”, Addison-Wesley, second edition,
2. RAJ KAMAL “Mobile Computing”, Second edition Oxford publication.

Reference Books:

1. RezaBehravanfar, “Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML”, ISBN: 0521817331, Cambridge University Press, October 2004,
2. ASOKE K TALUKDE, HASAN AHMED, OOPA YAVAGAI.”Mobile computing, Technology Application and service Creation”, 2nd Edition, McGraw Hill.

e-Learning Resources

1. https://www.youtube.com/watch?v=LZuzO0FKd0A (IIT Madras)
2. https://www.youtube.com/watch?v=5eS78dE2z6Y (NPTEL)
3. https://www.youtube.com/watch?v=EDDEsX7vaII (NPTEL)
4. https://www.youtube.com/watch?v=QHDxbbc1GWs (NPTEL)