MOBILE COMPUTING

Category: Programme elective course

Prerequisite: Data communication and Computer Networks

Learning Objectives: The objective is to learn emerging techniques in GSM, wireless MAC**.**
Learn mobile network and transport layer.
Learn mobile database, data disseminationand MANAT protocols

UNIT – I: INTRODUCTION, GSM, WIRELESS MAC (10 Hours)

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 AND TRANSPORT LAYER (10Hours)

Mobile Network Layer: Mobile IP (Goals, assumptions, entities and terminology, IP packetdelivery, agent advertisement and discovery, registration, tunneling 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: MOBILE DATABASE AND DATA DISSEMINATION (10 Hours)

Database Issues: Hoarding techniques, caching invalidation mechanisms, client server computing with adaptation, power-aware and context-aware computing, transactional models, query processing, recovery, and quality of service issues. Data Dissemination: Communications asymmetry, classification of new data delivery mechanisms, push-based mechanisms, pull-based mechanisms, hybrid mechanisms, selective tuning (indexing) techniques.

UNIT – IV: MANAT, PROTOCOLS (10 Hours)

Mobile Ad hoc Networks (MANETs): Overview, Properties of a MANET, spectrum of MANET applications, routing and various routing algorithms, security in MANETs.

Protocols and Tools: Wireless Application Protocol-WAP. (Introduction, protocol architecture, and treatment of protocols of all layers), Bluetooth (User scenarios, physical layer, MAC layer, networking, security, link management) and J2ME.

TEXT BOOKS :

1. Jochen Schiller,"Mobile Communications",Addison-Wesley.
2. Stojmenovic and Cacute, "Handbook of Wireless Networks and Mobile Computing"

REFERENCES:

1. Reza Behravanfar, "Mobile Computing Principles: Designing and Developing Mobile Applications with UML and XML", ISBN: 0521817331, Cambridge University Press.
2. Adelstein, Frank, Gupta, Sandeep KS, Richard III, Golden, Schwiebert, Loren, "Fundamentals of Mobile and Pervasive Computing", McGraw-Hill Professional.
3. Hansmann, Merk, Nicklous, Stober, "Principles of Mobile Computing", Springer.
4. Martyn Mallick, "Mobile and Wireless Design Essentials", Wiley DreamTech.