Course Title: Mobile Data Networks

Course Code: EE4316

Units: 3

Level: B4

Course Aims & Objectives:
This course is aimed at providing students with the knowledge of various network technologies and related protocol architectures to support mobile data communications. The network technologies covered in this course include GSM, IMT-2000, wireless LAN and ad-hoc networks. The multiple access control for these networks are also discussed. The protocols and mechanisms developed to support mobility in the Internet are introduced.

Intended Learning Outcomes:
On completion of this course, the students will be able to

1. Evaluate the performance of cellular networks
2. Recognise the design principles of GSM networks and GPRS service
3. Analyse and design wireless LAN
4. Recognise the design principles mobile IP

Syllabus:
Fundamentals of Cellular Networks
Cellular Topology, Signal-to-interference Topologies, Capacity Expansion Techniques

GSM Networks
System Architecture, Protocols, Localization and Calling, Handoff, New Data Services

GPRS Services
Reference Architecture, Location and Handoff Management, Protocol Layers

UMTS and IMT-2000
UMTS Architecture, UTRA FDD Mode, UTRA TDD Mode

802.11 Wireless LAN
System Architecture, Protocol Architecture, Medium Access Control, MAC management

Ad Hoc Networks
Routing Protocols, Service Discovery, Support of Multicast

Mobile IP
IP Packet Delivery, Agent Advertisement and Discovery, Registration, Tunneling and Encapsulation

Laboratory Experiment:
Nil
Teaching pattern:

Duration of course: one semester
Suggested lecture/tutorial/mix: Lecture Hour: 26 hours

Tutorial Hour*: 13 hours

*may be substituted with lectures/demonstrations

Assessment pattern:

Examination duration: 2 hours, at the end of the semester

Percentage of coursework, examination, etc.: 30% CW; 70% Exam

For a student to pass the course, at least 30% of the maximum marks for the examination must be obtained.

Pre-requisites: (Please quote course code & title)

EE3311 Networking II
or
EE3016 (old code: EE4010) WANs and Communication Protocols
or
EE3900 Computer Networks

Pre-cursor: (Please quote course code & title)

EE3313 Applied Queueing Systems
or
MA3160 Probability and Stochastic Processes

Exclusive Course: (Please quote course code & title)

CS4284 Mobile Computing

Equivalent Courses: (Please quote course code & title)

Nil

Equivalent to the Old Course Code and Title: (Please quote course code & title)

Nil

Textbook:


Reference Book:


Schiller J: Mobile Communications, (Addison-Wesley, 2000)