

### 3/3 MCA First Semester

CA5T4B

WIRELESS COMMUNICATIONS

Credits : 4

Lecture Hours : 4 periods / week

Internal assessment : 30 Marks  
Semester and Examination: 70 Marks

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#### Course Description:

To introduce the concepts of wireless communication using cellular environment. To make the students to know about the various modulation techniques, propagation methods, coding and multi access techniques used in the mobile communication. Various wireless network systems and standards are to be introduced.

#### Course Objective:

- It deals with the fundamental cellular radio concepts such as frequency reuse and handoff. This also demonstrates the principle of trunking efficiency and how trunking and interference issues between mobile and base stations combine to affect the overall capacity of cellular systems.
- It provides idea about analog and digital modulation techniques used in wireless used in wireless communication.
- It deals with the different types of equalization techniques used in wireless communication.
- It also deals with the different types of equalization techniques and diversity concepts.
- It provides an introduction to speech coding principles which have driven the development of adaptive pulse code modulation and linear predictive coding techniques.

#### UNIT I :

**Introduction to GSM:** Global System for Mobile Communication (GSM) system overview: GSM Mobile Services ,System architecture, Radio interface GSM protocols Architecture for signaling.

#### UNIT II:

**GPRS:** Over view of GPRS, Localization and calling for signaling, Handover, Security, General Packet Radio Services (GPRS): GPRS Architecture.

#### UNIT III :

**Infrared Vs radio transmission:** IEEE 802.11 – System Architecture, Protocol Architecture, Medium Access.

#### UNIT IV:

**layers :** Control Layer, MAC Management - HIPERLAN – Protocol architecture – Bluetooth technology - Bluetooth Physical Layer – Bluetooth MAC Layer.

#### UNIT V:

**Wireless ATM :** Motivation – ATM Working group – Services – Models – Functions – Radio Access layer – HandOver – Location Management.

#### UNIT VI :

**Mobile IP:** Goals, assumption and requirement, Entities and terminology, IP packet delivery, Agent advertisement and discovery, registration, tunneling and encapsulation, optimization - Dynamic Host Configuration protocol - Ad hoc Networks: Routing, Destination sequence distance vector, Dynamic source routing, Hierarchical Algorithm

**UNIT VII :**

**Alternative metrics:** Traditional TCP: Congestion control, slow start, Fast retransmit/Fast recovery - Indirect TCP – Snooping TCP – mobile TCP – Fast retransmit /Fast recovery – Transmission / timeout freezing. Selective retransmission – Transaction Oriented TCP

**UNIT VIII :**

**Wireless Application Protocols:** WAP Model - WAP Gateway – WAP Protocols – Wireless Local Loop – Introduction to WLL Architecture – WLL Technologies - VoIP Services for Mobile Networks - Global Mobile Satellite Systems

**Learning Resources****Text Books:**

1. Jochen Shiller, Mobile Communications , Pearson Education, 2/e, 2008.
2. Yi-Bing Lin & Imrich Chlamtac ,Wireless and Mobile Network Architecture, John Wiley & Sons, 1/e, 2008.
3. William C.Y. Lee ,Mobile Communications Design Fundamentals, 2/e, 2011.

**References Books:**

1. Mark Ciampa, Thomas ,Guide to Designing and Implementing Wireless LANs, Vikas Publishing House, 2001.
  2. Ray Rischpater ,Wireless Web Development, Springer Publishing, 1/e, 2000.
- Sandeep Singhal ,The Wireless Application Protocol, Pearson Education Asia, 1/e, 2002.