

## Wireless Networks

B.E. Sem. VII [INFT]

(Elective – I)

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### EVALUATION SYSTEM

	Time	Marks
<b>Theory Exam</b>	3 Hrs.	100
<b>Practical Exam</b>	–	–
<b>Oral Exam</b>	–	25
<b>Term Work</b>	–	25

**Prerequisite :** Networking Technology for Digital Devices, Convergence Technology for Networking in communication, C/C++/Java.

**Objective :** The main objective of this course is to get acquainted of Wireless Communication Systems and their Applications through today's technologies.

### SYLLABUS

**1. Introduction to Wireless Networks**

Evolution of Wireless Networks, Challenges, Overview of various Wireless Networks.

**2. Wireless Communications Principles and Fundamentals**

Introduction, The Electromagnetic Spectrum, The Cellular Concept, The Ad Hoc and Semi Ad Hoc Concepts, Wireless Services, Data Delivery Approaches, Overview of Basic Techniques and Interactions Between the Different Network Layers

**3. First Generation (1G) Cellular Systems**

Introduction, Advanced Mobile Phone System (AMPS), Nordic Mobile Telephony (NMT).

**4. Second Generation (2G) Cellular Systems**

Introduction, D-AMPS, cdmaOne (IS-95), GSM, IS-41, Data Operations, Cordless Telephony (CT).

**5. Third Generation (3G) Cellular Systems**

Introduction, 3G Spectrum Allocation, Third Generation Service Classes and Applications, Third Generation Standards.

**6. Fourth Generation (4G)**

Introduction, Design Goals for 4G and Beyond and Related Research Issues, 4G Services and Applications, Challenges.

**7. Satellite Networks**

Introduction, Satellite Systems, VSAT Systems, Examples of Satellite-based Mobile Telephony Systems, Satellite based Internet Access.

**8. Fixed Wireless Access Systems**

Wireless Local Loop versus Wired Access, Wireless Local Loop, Wireless Local Loop Subscriber Terminals (WLL), Wireless Local Loop Interfaces to the PSTN, IEEE 802.16 Standards.

**9. Wireless Local Area Networks**

Introduction, Wireless LAN Topologies, Wireless LAN Requirements, The Physical Layer, The Medium Access Control (MAC) Layer, Latest Developments.

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#### **10. Wireless ATM and Ad Hoc Routing**

Introduction, Wireless ATM Architecture, HIPERLAN 2: An ATM Compatible WLAN, Routing in Wireless Ad Hoc Networks.

#### **11. Personal Area Networks (PANs)**

Introduction to PAN Technology and Applications, Commercial Alternatives: Bluetooth, Commercial Alternatives: HomeRF.

#### **12. Security Issues in Wireless Systems**

The Need for Wireless Network Security, Attacks on Wireless Networks, Security Services, Wired Equivalent Privacy (WEP) Protocol, Mobile IP, Weaknesses in the WEP Scheme, Virtual Private Network (VPN).

#### **13. Economics of Wireless Networks**

Introduction, Economic Benefits of Wireless Networks, The Changing Economics of the Wireless Industry, Wireless Data Forecast, Charging Issues.

#### **14. Case Studies on Simulation of Wireless Network Systems**

Performance Evaluation of IEEE 802.11 WLAN Configurations Using Simulation, Simulation Analysis of the QoS in IEEE 802.11 WLAN System, Simulation Comparison of the TRAP and RAP Wireless LANs Protocols, Simulation Modeling of Topology Broadcast Based on Reverse-Path Forwarding (TBRPF) Protocol Using an 802.11 WLAN-based MONET Model.

#### **References :**

1. Wireless Networks (*P. Nicopolitidis, M.S. Obaidat, G.I. Papadimitriou, A.S. Pomportsis*) John Wiley & Sons, Ltd.
2. Wireless Communications Principles and Practices (*T. S. Rappaport*) Pearson Education.
3. Wireless Communications and Networks (*William Stallings*) Pearson Education.
4. Wireless and Mobile Network Architectures (*Yi-BaNG Lin and Imrich Chlamtac*) Wiley.
5. Wireless and Mobile Communication (*Sanjeev Kumar*) New Age International Publications.
6. Wireless Network Evolving :2G to 3G (*Garg*) Pearson Education.
7. Mobile Communication System (*Y. C. Lee*)
8. Guide to Wireless Network Security (*John R. Vacca*) Springer.
9. The Wireless Application Protocol (*Steve Mann, Scott Sbihli*) Wiley.
10. Mobile Communications (*Jochen Schiller*) Pearson, Second Edition.
11. Mobile Computing- Technology, Applications and Service Creation (*A.K. Talukder, R.R. Yavagal*) TMH.

