

**Prasad V. Potluri Siddhartha Institute of Technology:: Vijayawada.  
Department of Computer Science and Engineering**

**I/II M.Tech. (CSE) (First Semester)**

**17CSCS1T6C**

**WIRELESS and MOBILE NETWORKS  
Elective -II**

**Credits: 4**

**Lecture: 4 Periods/week**

**Internal Assessment: 40 Marks  
Semester end examination: 60 Marks**

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### **Course Description**

This Course provides a in depth learning of Wireless LAN, LTE and WiMAX technologies by introducing various tools and concepts used within. By focusing on LTE and WiMAX this course extends current network planning approaches to next generation wireless systems based on providing an essential resource of fixed and wireless broadband data access networks. With information presented in a sequential format, WLAN, WiMAX & LTE, Network Design, Optimization and Performance Analysis aids a progressive development of knowledge, complementing latter courses while also providing a valuable resource to students & network designers.

### **Course Outcomes:**

At the end of this course graduate will be able to:

- CO1:** Understand the concepts of Cellular communication Systems and Standards.
- CO2:** Describe IEEE 802.11 Standardization and its protocols.
- CO3:** Compare the technologies of WiMAX communications.
- CO4:** Analyze principles and protocols for different types of LTE Wireless network Architectures.

### **UNIT – I**

Data Transmission: Network Modelling, Internet Network Architecture, Physical Layer, Data Link Layer, Network Layer, Transport Protocols, Routing Protocols, Application Protocols, World Wide Web (WWW)

**UNIT – II**

Wireless LAN: Standardization, Architecture, The IEEE 802.11: Physical Layer, Medium Access Control (MAC) Layer, RF Channel Access, Power Management, 802.11n Enhancements for higher Throughputs, 802.11n : Physical Layer, MAC Layer, Throughput.

**UNIT – III**

WiMAX: WiMAX Standards, WiMAX Advantages, Network Architecture: ASN (Access Service Network), CPE, ASN-GW (Access Service Network Gateway), CSN (Connectivity Service Network), OSS/BSS (Operation Support System/Business Support System), ASP (Application Service Provider), WiMAX Network Layers: The PHY Layer, The MAC (Data) Layer, Error Correction, Frame Description, Resource Management, WiMAX Operation Phases, WiMAX Interference Reduction Techniques, WiMAX Resource Planning.

**UNIT – IV**

Universal Mobile Telecommunication System – Long Term Evolution (UMTS-LTE): Introduction, Architecture, Physical Layer (PHY), PHY Structure, PHY TDD, Multimedia Broadcast/Multicast Service (MBMS), Call Placement Scenario, PHY Characteristics and Performance, Resource Planning in LTE.

**Text Books:**

1. Leonhard Korowajczuk “LTE, WiMAX and WLAN Network Design, Optimization and Performance Analysis”, Wiley Publications, 2011.
2. Clint Smith, Daniel Collins, “Wireless Networks-Design and Integration for LTE, EVDO, HSPA and WIMAX”, Third Edition, McGraw Hill, 2014.

**Reference Books:**

1. Gordan L. Stuber, “Principles of Mobile Communication”, Springer, 2011.
2. Mobile communications Jochen H.Schiller, 2nd edition, Pearson Education.
3. Rappaport T.S., "Wireless Communications; Principles and Practice", Pearson Education, 2010
4. William Stallings, "Wireless Communication & Networking", Pearson Education Asia, 2010.