

**B.E. ELECTRONICS AND COMMUNICATION ENGINEERING**

Choice Based Credit System (CBCS)

**SEMESTER - VI****Mobile Communication (3:0:0) 3**

(Effective from the academic year 2021-22)

Course Code	21ET641	CIE Marks	50
Teaching Hours/Week (L:T:P)	3:0:0	SEE Marks	50
Total Number of Contact Hours	40	Exam Hours	3

**Course Objectives:**

This course will enable students to:

1. Understand the requirements for Long term evolution
2. Explore the architectural view of LTE network.
3. Identify the requirements and challenges in establishing a 5G network
4. Categorize the applications of 5G network

**Introduction:** Significance and scope of wireless technologies, Importance in the economic growth of the nation. Career perspectives. Impact on national economy, state of art and future directions in mobile communication.

**Module - 1****Introduction to LTE:**

The Context for the Long Term Evolution of UMTS, Requirements and Targets for the Long Term Evolution, Technologies for the Long Term Evolution.

**(8 Hours)****Module - 2****Network Architecture:**

Introduction, Overall Architectural Overview, Protocol Architecture, Quality of Service and EPS Bearers, The E-UTRAN Network Interfaces: S1 Interface, The E-UTRAN Network Interfaces: X2 Interface.

**(8 Hours)****Module - 3****Drivers for 5G: The 'Pervasive Connected World:**

Introduction, Historical Trend of Wireless Communications, Historical Trend of Wireless Communications, 5G Roadmap, 10 Pillars of 5G, 5G Architecture.

**(8 Hours)****Module - 4****The 5G Internet:**

Introduction, Internet of Things and Context-Awareness, Networking Reconfiguration and Virtualisation Support, Mobility, Quality of Service Control, Emerging Approach for Resource Over-Provisioning.

**(8 Hours)****Module - 5****Small Cells for 5G Mobile Networks:**

Introduction, What are Small Cells, Capacity Limits and Achievable Gains with Densification, Mobile Data Demand, Demand vs Capacity, Small-Cell Challenges, Conclusions and Future Directions.

**Cooperation for Next Generation Wireless Networks:**

Cooperative Diversity and Relaying Strategies, PHY Layer Impact on MAC Protocol Analysis, Case Study: NCCARQ

**Recap/Summary of all the modules.**

**(8 Hours)**

**Course outcomes:** The students will be able to:

- C01: Apply the characteristics/protocols of wireless communication to establish the LTE/5G communication channel
- C02: Examine the requirements in establishing the LTE/5G communication network
- C03: Explore the challenges in establishing 5G network
- C04: Present in a team, the recent developments in LTE/5G technology

**Textbooks:**

1. Stefania Sesia, Issam Toufik, Matthew Baker, "LTE – The UMTS Long Term Evolution From Theory to Practice", 2<sup>nd</sup> Edition, Wiley
2. Jonathan Rodriguez, "Fundamentals of 5G Mobile Networks", 2015, Wiley.

**References:**

1. Ramjee Prasad , "5G Outlook – Innovations and Applications", River Publishers,