

20CS013**WIRELESS COMMUNICATION NETWORKS**

Hours Per Week :

L	T	P	C
3	-	-	3

Total Hours :

L	T	P	WA/RA	SSH/HSB	CS	SA	S	BS
45	-	-	15	30	-	5	5	-

Course Description and Objectives:

The course addresses the fundamentals of wireless communications and provides an overview of existing and emerging wireless communications networks. It covers radio propagation and fading models, fundamentals of cellular communications, multiple access technologies, and various wireless networks, including past and future generation networks. Simulation of wireless systems under different channel environments will be an integral part of this course. The objective of the course is to introduce the students to the fundamentals of wireless communications and the evolution of wireless networks from the first generation to LTE and LTE advanced.

Course Outcomes:

Upon the Completion of the course, students will be able to:

- ✓ Understand the basic concept of wireless system design and get familiar with various wireless networks
- ✓ Understand the new trends in mobile/wireless communications networks.
- ✓ Understand multiple radio access techniques.
- ✓ Analyse various routing algorithms used in mobile/wireless networks.
- ✓ Identify the issues in transport and application layers.

SKILLS:

- ✓ Ability to apply knowledge on different sensors and design of different technology circuits using sensors.
- ✓ Ability to utilize a system approach to design a chip and operational performance

Unit – I

Cellular Concepts Systems Design Fundamentals: Review of digital communications, Frequency Reuse, Channel Assignment Strategies, Handoff Strategies, Interference and system capacity, Multipath channel characteristics, Improving Coverage & Capacity in Cellular Systems- Cell Splitting, Sectoring.

Unit – II

Fundamentals of Cellular Communications: Hexagonal cell geometry, Co-channel interference, Cellular system design, Sectoring using directional antennas.

Unit – III

Multiple Access Techniques: Frequency division multiple access (FDMA), Time division multiple access (TDMA), Code division multiple access (CDMA), Space division multiple access (SDMA), Orthogonal frequency division multiplexing (OFDM), Multicarrier CDMA (MC-CDMA), Random access methods.

Unit – IV

WIRELESS WIDE AREA NETWORKS: GSM: Evolution for data, 3G wireless systems, UMTS – Network architecture, CODEC, bearer service and QoS. CDMA: CDMA 2000 layering structure, forward link features, reverse link physical channels, WCDMA, evolution of IS 95 to CDMA 2000, IMT 2000, HSPA, HSPA+, LTE and LTE advanced.

Unit – V

Other Wireless systems: IEEE 802.11, WLAN (WiFi) WiMAX

TEXTBOOKS:

1. Mischa Schwartz, "Mobile Wireless Communications," Cambridge University Press, Paperback, 2013, ISBN: 9781107412712.

REFERENCEBOOKS:

1. Ian F. Akyildiz, David M. GutierrezEstevez, Elias Chavarria Reyes, "The evolution to 4G cellular systems: LTE-Advanced," Elsevier-Physical Communication, 2010.
2. Vijay K. Garg, Wireless Communications and Networking, Morgan Kaufmann Publishers, 2007, ISBN 978-0-12-373580-5.
3. Jochen Schiller, Mobile Communications, Addison-Wesley, Second edition, 2008.