

<b>Devi Ahilya University, Indore, India Institute of Engineering &amp; Technology</b>				<b>III Year B.E. Computer Engineering (Full Time)</b>			
Subject Code & Name	Instructions Hours per Week			Credits			
CER6G4 Wireless and Mobile Networks	L	T	P	L	T	P	Total
	3	1	0	3	1	-	4

**Learning Objectives:** To understand the basic concepts of wireless communication with focus on mobile networking.

- To provide knowledge of different techniques of wireless communication.
- To learn about integration of services and applications from fixed networks into mobile networks.

**Prerequisite:** Basic knowledge of Computer Networks.

### UNIT-I

**Introduction:** Wireless Networks, Wireless vs Wired Networks, mobile devices, mobile applications, mobile environments and limitations, Wireless transmission-frequencies and regulation, multipath propagation, channel fading, Multiplexing and Modulation techniques, Spread spectrum-DSSS & FHSS,

### UNIT-II

**Medium Access Control** – motivation for specialized MAC, Hidden/Exposed, Near/Far terminal effect, MAC protocols – SDMA, FDMA, TDMA, Reservation Aloha, PRMA, MACA, DSMA etc.

**Cellular networks-** overview, Cellular Concept and Frequency Reuse, Channel Allocation, Call Setup, Cell Handoffs, Location Management, CDMA, GSM- Architecture, GSM-Air Interface, protocols, HLR/VLR, localization & calling, security, GPRS.

### UNIT-III

**Wireless LAN :** Infra vs Radio transmission, infrastructure vs ad hoc network, IEEE 802.11- system and protocol architecture, MAC management, IEEE 802.11 flavours, Bluetooth – architecture, radio and basband layer, L2CAP, IEEE 802.15, WiMax and Zigbee overview

### UNIT-IV

**Mobile Network Layer :** Entities, Packet delivery, Agent Discovery, Tunneling and encapsulation, optimization, reverse tunnelling,

**Mobile Transport Layer** : Congestion control and implication of mobility, slow start, Mobile TCP – Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/ Fast recovery.  
**Support for Mobility** – File System – CODA, WAP –Architecture,

## **UNIT-V**

**Mobile Adhoc Networks-** Protocols and Routing,

**Advances in Mobile Technologies-** 5G and Beyond, Internet of Things (IoT), Internet of Everything (IoE), Wireless Sensor Networks, Mobile Opportunistic Networks

**Wireless Network Planning and Administration-** Wireless Hardware, Wireless Network Design and Deploy, Troubleshooting hardware and connection issues.

### **Learning Outcomes:**

Upon completing the course, students will:

- Be familiar with wireless communication methodologies
- Learn wireless communication protocols and different standards
- Be able to apply these concepts in Wireless Network planning, design and administration to support mobility.

### **Suggested Books and resources:**

- 1 Jochen Schiller, Mobile Communications, Pearson Education, 2/e, 2003.
- 2 W. Stallings, Wireless Communications & Networks, Pearson Education, 2/e, 2005.
- 3 Dharma P. Agrawal and Qing-An Zeng, Introduction to Wireless and Mobile Systems, Cengage Publication, 2012.
- 4 Wale Soyinka, Wireless Network Administration-A Beginner's Guide, Tata McGraw-Hill Edu, 2010.