Devi Ahilya University, Indore, India **Institute of Engineering & Technology**				**III Year B.E.** **Information Technology** **(Full Time)**			
Subject Code & Name	**Instructions Hours per Week**			**Credits**			
	L	**T**	**P**	**L**	**T**	**P**	**Total**
ITR6C1 **Wireless Protocols and Mobile Networks**	**3**	**1**	**0**	**3**	**1**	**-**	**4**
Duration of Theory Paper: 3 Hours							

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.

COURSE CONTENTS

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, Interne of Things (IoT), Internet of Every Thing (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.

Books Recommended:

1. Jochen Schiller, Mobile Communications, Pearson Education, 2/e, 2003.
2. W. Stalling, 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.
