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**			
6ITRC1	**L**	**T**	**P**	**L**	**T**	**P**	**Total**
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:

1. Be familiar with wireless communication methodologies
2. Learn wireless communication protocols and different standards
3. 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.