

Devi Ahilya University, Indore, India Institute of Engineering & Technology				ME – I Year (Spl Digital Communication) Semester- B			
Subject Code & Name	Instructions Hours per Week			Credits			
DCR2C2 Mobile Communication Networks	L	T	P	L	T	P	Total
	3	1	2	3	1	1	5
Duration of Theory Paper: 3 Hours							

Course Objectives: To provide the knowledge of cellular concept, types of wireless networks, different generations mobile communication systems, and the aspects of mobile radio environment which is very different than conventional communication system.

Prerequisite(s): Knowledge of digital communication, OSI Model and internet protocol.

COURSE CONTENTS

Unit 1

Evolution of Modern Mobile Wireless Communication Systems : Different types of Wireless Communication, Classification of Wireless Networks: Wireless Local Area Networks, Personal Area Networks, Fixed Wireless Access, Ad-hoc and Sensor Networks, Satellite Cellular Communication, First Generation, Second Generation, Third Generation wireless Networks, All-IP Networks, Requirements for services, Technical Challenges of Wireless Communications.

Unit 2

Cellular Systems Design Fundamentals: Multiple access Techniques, Cellular Structure, Cell Cluster, Frequency Reuse, Co-channel and Adjacent channel Interference, Enhancement of system Capacity, Channel Assignment, Cellular Communication principles, Mobility Management, Radio Resource Management, 1G AMPS system.

Unit 3

2G and 2.5 G Systems: GSM system architecture, Air interface, Logical and Physical Channels, Voice encoding, channel encoding, Cryptography, Frequency hopping, Equalization in GSM, Connection establishment and Handover, Protocols and Signaling, Services and Billing.
GPRS system architecture, Signaling, Roaming, Interfaces and Related Protocols, IP internetworking Model, GPRS applications.

Unit 4

3G Systems: WCDMA/UMTS: System Overview, Air Interfaces, Physical and Logical Channels, Speech coding, Multiplexing, Channel Encoding, Spreading, Modulation, Power control, Connection Establishment, Handover.
3GPP LTE: System Overview, Physical Layer, Logical and Physical Channels, Physical Layer Procedures.

Unit 5

IP for Mobile Networks : Overview of IP, IP Routing protocols, Basic Mobile IP, IP for GPRS and UMTS, Integration of different Technologies, Mobility management in Wireless Networks, All IP Networks, Key technologies for 4G.

BOOKS RECOMMENDED:

- [1]. A. F. Molisch, "Wireless Communications", Second Edition, Wiley Publications, 2014.
- [2]. I. S. Misra, "Wireless Communications & Networks", Second Edition, MGH, 2013.
- [3]. J. Schiller, "Wireless Communications", Second Edition, Pearson Education, 2008.
- [4]. T. S. Rappaport, Wireless Communications Principles & Practice, 2nd Edition, PHI, 2002.