

GOVT. POLYTECHNIC, HAMIRPUR (H.P.)
Lesson Planning and Coverage

Branch: Computer Engineering

Semester: 3rd

Subject: Data Communication & Computer Networks

Session: Aug -Dec, 2026

Teacher: Varun Gupta

Laboratory: Yes

Sr. No .	No of Lectures	Chapter/ Unit Description	Detailed contents	Reference Resources	Remarks
1	14	UNIT 1 Overview of Data Communication	Data Communication, Data Communication Characteristics - Delivery, Accuracy, Timeliness, Jitter; Components of Communication System, Data Flow - Simplex, Half-Duplex, Full-Duplex; Analog and Digital Signals, Peer-to-Peer and Client-Server Networks, Characteristics of Analog Signals - Frequency, Amplitude, Wavelength; Composite Signal, Phase, Bandwidth; Low Pass and Band Pass Channels, Baseband and Broadband Transmission, Data Rate Limit	R1,R2 ,R3, R6	
2	14	UNIT 2 Computer Networks	Objectives of Computer Networks, Applications, Network Protocols, Packet Switching, Circuit Switching, Network Topologies, Types of Computer Networks - PAN, LAN, MAN, WAN, Internetworks, Internet - History, Internet Infrastructure, DNS, Internet Routing Hierarchy	R1,R2	
3	14	UNIT 3 ISO OSI	Advantages of Layered Network Architecture, ISO	R1,R2,R3	

		Reference Model	OSI Reference Model, Principles of OSI Reference Model, Functions of OSI Layers, Overview of Basic Protocols at Physical, Data Link, Network and Transport Layer		
4	12	UNIT 4 Transmission Media and Networking Devices	Wired Media - Coaxial, UTP, STP, Optical Fibre Cables; Wireless Media - Infrared, Radio Waves, Microwaves; Terrestrial and Satellite Wireless Communication; Transmission Impairments, Networking Devices - Repeater, Hub, Bridge, Switch, Router, Gateway, Modem	R1,R2,R3	
5	10	UNIT 5 TCP/IP Protocol Suite	Layers in TCP/IP Protocol Suite, TCP/IP Protocol Data Units, IPv4 and IPv6 addresses, IPv4 CIDR Notation, Netmasks and Subnets, IPv4 Address Classes and Reserved Ranges, TCP and UDP, Ports, Well-known Ports, Telnet, FTP, SNMP, DHCP and DNS, Overview of Routing - Flooding, Distance Vector, Link State	R1,R2,R3	

References:

1. Computer Networks, Andrew S. Tanenbaum, PHI
2. TCP/IP Illustrated, Volume-1, W. Richard Stevens, Addison Wesley
3. Data and Computer Communications, William Stallings, PHI
4. An Engineering Approach to Computer Networking, S. Keshav, Addison Wesley/Pearson
5. An Integrated Approach to Computer Networks, Bhavneet Sidhu, Khanna Publishing House
6. Data Communication and Computer Networks by Behrouz Forouzan.

COURSE OUTCOMES:

After completing this course the students will be able to:

CO-1. Understand the terminology used in the domain of computer networks.

CO-2. Explain the underlying principles of computer networks.

CO-3. Identify and use common networking devices and cables.

CO-4. Understand the working of TCP/IP as a case study.

**Signature of Teacher with Date
of HOD**

Signature

**GOVT. POLYTECHNIC, HAMIRPUR (H.P.)
Lesson Planning and Coverage**

Branch: Computer Engineering
4th

Semester:

Subject: Wireless Communication
June 2026

Session: Jan -

Teacher: Varun Gupta

Laboratory: No

Sr. No .	No of Lectures	Chapter/ Unit Description	Detailed contents	Reference Resources	Remarks
1	10	UNIT 1 Introduction to Wireless	Wireless communication and its applications, advantages and disadvantages of	R1	

		Communicati on	wireless communication, Types of Services: broadcast, paging, cellular telephony, trunking radio, cordless telephony, WLAN, PAN, adhoc & sensor networks, fixed wireless access; challenges in wireless communication.		
2	08	UNIT 2 Electromagne tic Spectrum	Electromagnetic spectrum, licensed/unlicensed spectrum bands, ISM band, terrestrial and satellite microwave communication, broadcast radio, infrared and light wave communication, wireless transmission impairments – attenuation, distortion, noise, interference, path loss, shadowing and fading.	R1,R2	
3	12	UNIT 3 Fundamental s of Wireless Communicati on	Concept of bandwidth, analog and digital signals, data rate, signal strength, SNR, RSSI, electromagnetic wave propagation: ground waves, sky waves and line-of-sight propagation; radio waves, microwaves, infrared; Overview of Propagation Mechanisms: reflection, diffraction and scattering; outdoor and indoor propagation.	R1,R2,R 3	
4	12	UNIT 4 Cellular Architecture	Cellular Communication: cellular concept, cellular system architecture, cells, clusters, frequency reuse, cell splitting, handoff, Digital Cellular System: TDMA, ETDM, PCS, CDMA, Global System for Mobile Communication (GSM), GSM network: switching system, BSS, operation and support system, Generations of cellular networks and	R1,R2,R 3	

			their features (1G – 5G).		
5	06	UNIT 5 Wireless LAN Technology and Bluetooth	Wireless LAN (WLAN), IEEE-802.11, WLAN applications, WLAN types, WLAN problems – hidden station and exposed station problems; Bluetooth technology, Direct Sequence Spectrum Scheme, Frequency Hopping Spread Spectrum, Personal Area Networks.	R1,R2,R 3	

References:

- R1. Mobile Computing: Technology, Applications and Service Creation by Asokek Talukdar and Roop R. Yavagal, TMA.
- R2. Wireless Communication and Networking- William Stallings, PHI.
- R3. <https://W3schools.com/>

COURSE OUTCOMES:

After completing this course students will be able to:

- CO-1 Explain various wireless communication technologies
- CO-2 Understand electromagnetic spectrum and transmission impairments.
- CO-3 Explain various propagation modes for wireless communication.
- CO-4 Understand the architecture of cellular communication.
- CO-5 Understand Bluetooth standard for wireless communication.

**Signature of Teacher with Date
of HOD**

Signature

