

Course Code	Course Title					Core/Elective	
PE672EC	DATA COMMUNICATION AND COMPUTER NETWORKING					Elective	
Prerequisite	Contact Hours per Week				CIE	SEE	Credits
	L	T	D	P			
AC PC502EC	3	-	-	-	30	70	3

Course Objectives:

- To provide a conceptual foundation for the study of data communications using the open Systems interconnect (OSI) model for layered architecture.
- To study the principles of network protocols and internetworking
- To understand the Network security and Internet applications.
- To understand the concepts of switched communication networks.
- To understand the performance of data link layer protocols for error and flow control.
- To understand various routing protocols and network security.

Course Outcomes:

- Understand the working of various network topologies and circuit and packet switching
- Comprehend the role of data link layers and significance of MAC protocols
- Understand the networking protocols and Internet protocols
- Understand the transport layer working with TCP, UDP and ATM protocols
- Comprehend the functionality of application layer and importance of network security.

UNIT - I

Data communication: A Communication Model, The Need for Protocol Architecture and Standardization, Network Types: LAN, WAN, MAN. Network Topologies: Bus, Star, Ring, Hybrid. Line configurations. Reference Models: OSI, TCP/IP.

Circuit switching: Circuit Switching Principles and concepts.

Packet switching: Virtual circuit and Datagram subnets, X.25.

UNIT - II

Data Link Layer: Need for Data Link Control, Design issues, Framing, Error Detection and Correction, Flow control Protocols: Stop and Wait, Sliding Window, ARQ Protocols, HDLC.

MAC Sub Layer: Multiple Access Protocols: ALOHA, CSMA, Wireless LAN. IEEE 802.2, 802.3, 802.4, 802.11, 802.15, 802.16 standards. Bridges and Routers.

UNIT - III

Network Layer: Network layer Services, Routing algorithms: Shortest Path Routing, Flooding, Hierarchical routing, Broadcast, Multicast, Distance Vector Routing, and Congestion Control Algorithms.

Internet Working: The Network Layer in Internet: IPV4, IPV6, Comparison of IPV4 and IPV6, IP Addressing, ATM Networks.

UNIT - IV

Transport Layer: Transport Services, Elements of Transport Layer, Connection management, TCP and UDP protocols, ATM AAL Layer Protocol.

UNIT - V

Application Layer: Domain Name System, SNMP, Electronic Mail, World Wide Web.

Network Security: Cryptography Symmetric Key and Public Key algorithms, Digital Signatures, Authentication Protocols.

Suggested Reading:

1. Andrew S Tanenbaum, “Computer Networks,” 5/e, Pearson Education, 2011.
2. Behrouz A. Forouzan, “Data Communication and Networking,” 3/e, TMH, 2008.
3. William Stallings, “Data and Computer Communications,” 8/e, PHI, 2004.
4. Douglas E Comer, “Computer Networks and Internet”, Pearson Education Asia, 2000.
5. Prakash C. Gupta, “Data Communications and Computer Networks”, PHI learning, 2013