

**A Text Book Of**

# **ADVANCE COMPUTER NETWORK**

**(COURSE CODE : 315321)**

**Semester - V**

**THIRD YEAR DIPLOMA IN COMPUTER ENGINEERING GROUP  
(BD / CM / CO / CW / HA / IF / SE)**

***As Per MSBTE's 'K' Scheme Syllabus w.e.f. Academic Year 2025***

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# *Preface ...*

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We take an opportunity to present this book entitled as “**Advance Computer Network**” to the students of Fifth Semester [Third Year Diploma in Computer Engineering Group (BD/CM/CO/CW/HA/IF/SE)]. The book is written strictly according to the Revised Syllabus (K-Scheme) prepared by Maharashtra State Board of Technical Education (MSBTE).

The book has its own unique features. It brings out the subject in a very simple and lucid manner for easy and comprehensive understanding of the basic concepts. The book covers theory of Internet Architecture and Network Layer, Routing Protocols, Transport Layer Protocols, Application Layer Protocols and Wireless Network Technologies.

A special word of thank to Shri. Dineshbhai Furia, Mr. Jignesh Furia for showing full faith in us to write this text book. We also thank to Mr. Amar Salunkhe and Mrs. Prachi Sawant of M/s Nirali Prakashan for their excellent co-operation.

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We welcome constructive suggestions from our colleagues and students.

**Authors**





# Syllabus ...

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## 1. Internet Architecture and Network Layer

- 1.1 Structure of Internet, Intranet, Role of Internet Service Provider (ISP) and Internet Corporation for Assigned Names and Numbers (ICANN)
- 1.2 IPv4 - Header Format, IPv6 - Header Format
- 1.3 Subnet, Subnet Addressing and Address Masking, Supernetting
- 1.4 Address Mapping - Address Resolution Protocol (ARP) - Mapping Logical to Physical Addresses, Working and Message Format, Reverse Address Resolution Protocol (RARP) - Mapping Physical to Logical Addresses Working and Message Format

## 2. Routing Protocols

- 2.1 Router Architecture, Routing Table, Queueing and Switching
- 2.2 Routing Protocols - Intra Domain routing - Distance Vector Routing-Creating Distance Vector Routing Tables, Initialization, Sharing, Updating - Routing Information Protocol (RIPv2), Link State Routing - Open Shortest Path First (OSPF) - Types of Links, Graphical Representation, Inter Domain Routing - Path Vector Routing- Border Gateway Protocol (BGPv4)
- 2.3 Internet Control Message Protocol (ICMP) - Types of Messages, Message Format, Error Reporting Messages

## 3. Transport Layer Protocols

- 3.1 Process to Process Delivery - Client/Server Paradigm, Multiplexing and Demultiplexing, Connectionless vs. Connection - Oriented Service
- 3.2 User Datagram Protocol (UDP) - Ports - Well Known Ports for UDP Header Format, Features and Applications
- 3.3 Transmission Control Protocol (TCP) - TCP Services, TCP Features, Segment, Three-way Handshaking, Flow Control, Error Control, Congestion Control - Open Loop, Closed Loop
- 3.4 TLS (Transport Layer Security) - Working and Applications
- 3.5 Stream Control Transmission Protocol (SCTP) - Services and Features

## 4. Application Layer Protocols

- 4.1 Domain Name System (DNS) Architecture, Domain Types, DNS Name Space, Domain Name Resolution and Mapping to Physical Addresses
- 4.2 Electronic Mail
  - (i) Message Transfer Agent - Simple Mail Transfer Protocol (SMTP) Components, Working
  - (ii) Message Access Agent - Post Office Protocol (POP) and Internet Message Access Protocol (IMAP)
- 4.3 File Transfer Protocol (FTP), Anonymous FTP
- 4.4 Remote Logging: Telnet, Remote Desktop
- 4.5 World Wide Web (WWW) and HyperText Transfer Protocol (HTTP)- Architecture, Types of Web Documents, HTTP Transaction
- 4.6 Pretty Good Privacy (PGP) - Security Parameters, Services, A Scenario or Overview of - PGP Algorithms, Key Rings, PGP Certificates

## 5. Wireless Network Technologies

- 5.1 Wireless Network Communication - 3G, 4G, 5G
- 5.2 SDN (Software Defined Network) - Architecture, Working, Applications
- 5.3 Network Functions Virtualization (NFV) - Architecture, Benefits, Applications
- 5.4 Edge Computing and Edge Networking - Definition, Components, Challenges, Applications
- 5.5 Multimedia Wireless Networks - Streaming Audio and Video, Voice Over Internet Protocol (VoIP), Protocols - Real - Time Transport Protocol (RTP), Real-Time Streaming Protocol (RTSP)



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<b>1. Internet Architecture and Network Layer</b>	<b>1.1 – 1.44</b>
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<b>2. Routing Protocols</b>	<b>2.1 – 2.40</b>
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<b>3. Transport Layer Protocols</b>	<b>3.1 – 3.36</b>
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<b>4. Application Layer Protocols</b>	<b>4.1 – 4.54</b>
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<b>5. Wireless Network Technologies</b>	<b>5.1 – 5.34</b>
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