COMPUTER NETWORKS
(Common to CSE & IT)

Course Code: 19CT1110

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Course Outcomes: At the end of the Course the student will be able to:

CO1: Outline Network models and Transmission media.

CO2: Compare various error control and flow control concepts.

CO3: Summarize various Routing algorithms and Congestion control principles.

CO4: Describe Transport layer protocols.

CO5: Explain the application layer protocols.

UNIT-I (8 Lectures)

DATA COMMUNICATION : Characteristics, Components, Data flow, Network criteria, Topologies, Network model, Layered tasks, ARPANET, OSI model, TCP/IP protocol suite, Addressing (Text Book-2).

PHYSICAL LAYER: Transmission Media: Guided and unguided, Connecting devices: Hub, switch, bridge, router, Gateway. (Text Book-2).

Learning Outcomes: At the end of the unit the student will be able to

1. state the characteristics of network components and data flow.(L1)
2. discuss the network models and protocol stack.(L2)
3. differentiate transmission media and addressing mechanisms.(L2)

UNIT-II (12 Lectures)

DATA LINK LAYER: Design issues, Error detection and correction, Elementary data link protocols, Sliding window protocols. (Text Book-1).

RANDOM ACCESS: ALOHA, CSMA/CD, CSMA/CA, Controlled access, Channelization, Wired LAN: IEEE Standards, Standard Ethernet, Wireless LAN:IEEE802.11, ATM: architecture,layers (Text Book-2).

Learning Outcomes: At the end of the unit the student will be able to

1. classify error detection and correction techniques. (L2)
2. explain random access and controlled access protocols. (L2)
3. contrast various ATM layers.(L2)

UNIT-III (12 Lectures)

NETWORK LAYER: Design issues, Routing algorithms, Internetworking, Network layer in the Internet. (Text Book-1).

CONGESTION CONTROL: Approaches to Congestion Control, Traffic-Aware Routing, Traffic Throttling, Load shedding, traffic shaping. (Text Book-1).

Learning Outcomes: At the end of the unit the student will be able to:

1. describe the design issues and routing algorithms in the network layer. (L2)
2. explain the internet control protocols. (L2)
3. discuss the various congestion control mechanisms (L2)

UNIT-IV **(8 Lectures)**

TRANSPORT LAYER: Transport services, Elements of transport Protocols, TCP and UDP (Text Book-1).

DELAY-TOLERANT NETWORKING:DTN Architecture, The Bundle Protocol (Text Book-1).

Learning Outcomes: At the end of the unit the student will be able to

1. summarize various transport services available in the transport layer.(L2)
2. differentiateTCP and UDP protocols.(L2)
3. discuss DTN architecture.(L2)

UNIT-V **(10 Lectures)**

APPLICATION LAYER: Domain Name Space (DNS), SNMP, Electronic mail: MIME, SMTP, IMAP.

CONTENT DELIVERY: Content Delivery Networks, Peer-to-Peer Networks.

Learning Outcomes: At the end of the unit the student will be able to

1. describe the concepts of DNS. (L2)
2. explain about electronic mail protocols.(L2)
3. discuss the content delivery networks.(L2)

TEXT BOOKS:

1. Andrew S. Tanenbaum, David J. Wetherall, *Computer Networks* , 5th Edition, Pearson New International Edition, 2016.
2. Behrouz A. Forouzan, *Data Communication and Networking*, 4th Edition, McGraw- Hill, 2017.

REFERENCES:

1. William Stallings, *Data and Computer Communication*, 8th Edition, Pearson, PHI, 2013.
2. Douglas Comer, *Internetworking with TCP/IP*, 6th Edition, PHI, 2015.

WEB REFERENCES:

1. https://nptel.ac.in/courses/106105183/