



# 19IT311

# DATA COMMUNICATIONS & NETWORKING

Hours Per Week :

L	T	P	C
3	-	2	4

Total Hours :

L	T	P	WA/RA	SSH/HSH	CS	SA	S	BS
45	-	30	5	40	5	20	5	2



**SOURCE:**

<https://nizamtaher.wordpress.com/topics/topic-1-introduction-of-computer-network/>

**PREREQUISITE COURSES:** Data Structures; Operating Systems.

**COURSE DESCRIPTION AND OBJECTIVES:**

This course focuses on imparting knowledge about the aspects of data communication and computer network systems. It also provides essential knowledge about the OSI/ISO reference model and TCP/IP model. In addition, it gives good solid foundation on network communication system layers being the physical, data link, network, transport and application layers.

**COURSE OUTCOMES:**

Upon completion of the course, the student will be able to achieve the following outcomes:

COs	Course Outcomes	POs
1.	Analyse, define, and explain the design issues of layers in the communication system used in computer networks.	1
2	Apply the routing algorithms for given network scenario.	2
3	Analyse the best fitting logical addressing for the requirements from the organization.	3
4	Evaluate the protocols for given situation to achieve the more channel utilization.	4

**SKILLS :**

- ✓ *Establish local area networks with different topologies.*
- ✓ *Evaluate various routing protocols.*
- ✓ *Network trouble shooting such as installing network interface card drivers, setting IP.*
- ✓ *Addresses, and subnet masking etc.*

**UNIT-I** **L-9**

**DATA COMMUNICATION AND NETWORKS:** Data communications, Networks, The Internet, Protocols and standards, Network models, Layered tasks, The OSI model, Layers in the OSI model, TCP/IP protocol suite, Addressing, Physical layer and media, Data and signals, Analog and digital, Periodic analog signals, Digital signals, Transmission impairment, Data rate limits.

**UNIT -II** **L-9**

**ERROR CODES AND MEDIUM ACCESS:** Error detection and correction, Data link control, Framing, flow and error control, Multiple access, Random access, Aloha, Controlled access, Channelization, IEEE standards, Standard ethernet, Fast ethernet, Gigabit ethernet, IEEE 802.11, Bluetooth.

**UNIT-III** **L-9**

**NETWORK LAYER:** Logical addressing, IPv4 addresses, IPv6 addresses, Internet protocol, Internetworking, IPv4, IPv6, Transition from IPv4 to IPv6, Address mapping, Error reporting and multicasting, Address mapping, ICMP, IGMP, ICMPv6, Delivery, Forwarding and routing, Delivery, forwarding, Unicast routing protocols, Multicast routing protocols.

**UNIT-IV** **L-9**

**TRANSPORT LAYER:** Process-Process Delivery, UDP, TCP and SCTP, Process-to-Process delivery, user datagram protocol (UDP), TCP, SCTP, Congestion control and quality of service, Data traffic, congestion, Congestion control, Two examples, Quality service, Techniques to improve QoS, Integrated services, Differentiated services, QoS in switched networks.

**UNIT-V** **L-9**

**APPLICATION LAYER:** Domain name system, Name space, Domain name space, Distribution of name space, DNS in the internet, Resolution, DNS messages, Types of records, Registrars, dynamic domain name system (DDNS), Encapsulation, Remote logging, Electronic mail and file transfer, Remote logging, Telnet, Electronic mail, File transfer.

**TEXT BOOK:**

Behrouza A. Forouzan, "Data Communications and Networking", 4<sup>th</sup> edition, TMH, 2007.

**REFERENCE BOOKS:**

1. Andrew S Tanenbaum, "Computer Networks", 5<sup>th</sup> edition, Pearson Education, 2014.
2. William Stallings, "Data and Computer Communications", 10<sup>th</sup> edition, Pearson Education, 2017.