Lovely Professional University, Punjab

Course Code	Course Title	Course Planner
CSE306	COMPUTER NETWORKS	17451::Dr. Isha

Course Outcomes :Through this course students should be able to

CO1 :: describe the importance of data communications and the Internet in supporting business communications and daily activities

CO2 :: differentiate different types of network devices and their functions within a network

CO3 :: examine the practical utilization of networking standards and protocols in relevant scenarios

CO4 :: categorize routing protocols and congestion control mechanism pertaining to functionality

CO5 :: discover the basic protocols of computer networks, and how they can be used to assist in network design and implementation

CO6 :: evaluate sub-network using classful and classless addressing scheme

TextBooks (T)			
Sr No	**Title**	**Author**	**Publisher Name**
T-1	DATA COMMUNICATIONS AND NETWORKING	BEHROUZ FOROUZAN	MCGRAW HILL EDUCATION

Reference Books (R)			
Sr No	**Title**	**Author**	**Publisher Name**
R-1	COMPUTER NETWORKS	ANDREW S. TANENBAUM	PEARSON

Relevant Websites (RW)		
Sr No	**(Web address) (only if relevant to the course)**	**Salient Features**
RW-1	https://nptel.ac.in/courses/106/106/106106091/	Lecture wise content is given on this link
RW-2	https://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-829-computer-networks-fall-2002/lecture-notes/	MIT university lecture wise content

Audio Visual Aids (AV)		
Sr No	**(AV aids) (only if relevant to the course)**	**Salient Features**
AV-1	https://nptel.ac.in/courses/106/106/106106091/	Audio video link for the topics on Computer Networks
AV-2	http://freevideolectures.com/Course/2308/Internet-Technology/6	Video lecture on subnetting

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Software/Equipments/Databases

Sr No	(S/E/D) (only if relevant to the course)	Salient Features
SW-1	http://www.packettracernetwork.com/	Packet Tracer
SW-2	http://www.gns3.com/	GNS3

LTP week distribution: (LTP Weeks)	
Weeks before MTE	7
Weeks After MTE	7
Spill Over (Lecture)	

Detailed Plan For Lectures

Week Number	Lecture Number	Broad Topic(Sub Topic)	Chapters/Sections of Text/reference books	Other Readings, Relevant Websites, Audio Visual Aids, software and Virtual Labs	Lecture Description	Learning Outcomes	Pedagogical Tool Demonstration/ Case Study / Images / animation / ppt etc. Planned	Live Examples
Week 1	Lecture 1	INTRODUCTION (Networks and Types)	T-1 R-1	RW-1 AV-1	Delivery of lecture zero and describe the basics of network and their applications	Learn about the application of computer network in real life and Learn about application of network in home, business as well as in other areas	Peer to peer discussion, Images in slides, video lecture will be used and Images in slides.	Talk about the various kind of network like mobile network, satellite network, cable TV network and Interaction between any two devices
		INTRODUCTION(Uses of Computer Networks)	T-1 R-1	RW-1 AV-1	Delivery of lecture zero and describe the basics of network and their applications	Learn about the application of computer network in real life and Learn about application of network in home, business as well as in other areas	Peer to peer discussion, Images in slides, video lecture will be used and Images in slides.	Talk about the various kind of network like mobile network, satellite network, cable TV network and Interaction between any two devices

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 1	Lecture 2	INTRODUCTION(Network hardware architecture and its topologies and device like HUB, Switch and Routers)	T-1 R-1	RW-1 AV-1	L-2: Describes the LAN,MAN,WAN and various Topologies. L-3: Describes the connecting devices like router, hub and switch.	L-2 Learn about the various topology in network as well as types of connections L-3 Learn about the various interconnecting devices	L-2 Images in slides, peer to peer discussion L-3 images of router, Hub, switch as well as debate on function of these devices	L-2 devices connected in laboratory, internet, cable TV Network L-3 Connecting labs with switch and then connect to router for outside world
	Lecture 3	INTRODUCTION(Network hardware architecture and its topologies and device like HUB, Switch and Routers)	T-1 R-1	RW-1 AV-1	L-2: Describes the LAN,MAN,WAN and various Topologies. L-3: Describes the connecting devices like router, hub and switch.	L-2 Learn about the various topology in network as well as types of connections L-3 Learn about the various interconnecting devices	L-2 Images in slides, peer to peer discussion L-3 images of router, Hub, switch as well as debate on function of these devices	L-2 devices connected in laboratory, internet, cable TV Network L-3 Connecting labs with switch and then connect to router for outside world
Week 2	Lecture 4	INTRODUCTION(Network software architecture and its layers and protocols)	T-1 R-1	RW-1 AV-1	Describe the protocol hierarchy, design issues,connection oriented, connection less, service primitives	Learn about design issues, protocol hierarchy and various service primitives	Images of protocol Hierarchy, service primitives, peer to peer discussion	Client-server Interaction
	Lecture 5	NETWORK MODELS (Protocol Layering)	T-1		Need of layered approach in networking	Learn about the need of layer approach in the networking like the OSI model	Learn about the OSI layer functions	Sending letter through postbox
	Lecture 6	NETWORK MODELS(OSI Model)	T-1		L-6: Describe the OSI model with functions of each layer L-7: Description of the TCP/IP model and the comparison with OSI model	L-6 Learn about the OSI layer functions L-7 Learn TCP/IP model	L-6 Image of OSI model and its layer, video lecture will be used L-7 Image of TCP/IP model, Video lecture will be used	L-6 sending letter through postbox L-7 Exchange of email, chatting application
		NETWORK MODELS (TCP/IP protocol suite)	T-1		L-6: Describe the OSI model with functions of each layer L-7: Description of the TCP/IP model and the comparison with OSI model	L-6 Learn about the OSI layer functions L-7 Learn TCP/IP model	L-6 Image of OSI model and its layer, video lecture will be used L-7 Image of TCP/IP model, Video lecture will be used	L-6 sending letter through postbox L-7 Exchange of email, chatting application

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 3	Lecture 7	NETWORK MODELS(OSI Model)	T-1		L-6: Describe the OSI model with functions of each layer L-7: Description of the TCP/IP model and the comparison with OSI model	L-6 Learn about the OSI layer functions L-7 Learn TCP/IP model	L-6 Image of OSI model and its layer, video lecture will be used L-7 Image of TCP/IP model, Video lecture will be used	L-6 sending letter through postbox L-7 Exchange of email, chatting application
		NETWORK MODELS (TCP/IP protocol suite)	T-1		L-6: Describe the OSI model with functions of each layer L-7: Description of the TCP/IP model and the comparison with OSI model	L-6 Learn about the OSI layer functions L-7 Learn TCP/IP model	L-6 Image of OSI model and its layer, video lecture will be used L-7 Image of TCP/IP model, Video lecture will be used	L-6 sending letter through postbox L-7 Exchange of email, chatting application
	Lecture 8	PHYSICAL LAYER: Signal & Media(Basics for Data Communications and Analog and Digital signals)	T-1	RW-1 AV-1	L-8 :Describe the basics of data and signals L-9: Describes the various data rate methods for the noiseless and noisy channel	L-8 learn the concept of digital and analog signal transmission L-9 Learn about the various methods data rate methods with examples	L-8 Images in slides and peer to peer discussion L-9 Images in slides, video lectures will be used	L-8 downloading speed to download data from internet, Connect the system to exchange data L-9 Wifi, wireless and jamming of signals network
		PHYSICAL LAYER: Signal & Media(Data Rate)	T-1	RW-1 AV-1	L-8 :Describe the basics of data and signals L-9: Describes the various data rate methods for the noiseless and noisy channel	L-8 learn the concept of digital and analog signal transmission L-9 Learn about the various methods data rate methods with examples	L-8 Images in slides and peer to peer discussion L-9 Images in slides, video lectures will be used	L-8 downloading speed to download data from internet, Connect the system to exchange data L-9 Wifi, wireless and jamming of signals network

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 3	Lecture 9	PHYSICAL LAYER: Signal & Media(Basics for Data Communications and Analog and Digital signals)	T-1	RW-1 AV-1	L-8 :Describe the basics of data and signals L-9: Describes the various data rate methods for the noiseless and noisy channel	L-8 learn the concept of digital and analog signal transmission L-9 Learn about the various methods data rate methods with examples	L-8 Images in slides and peer to peer discussion L-9 Images in slides, video lectures will be used	L-8 downloading speed to download data from internet, Connect the system to exchange data L-9 Wifi, wireless and jamming of signals network
		PHYSICAL LAYER: Signal & Media(Data Rate)	T-1	RW-1 AV-1	L-8 :Describe the basics of data and signals L-9: Describes the various data rate methods for the noiseless and noisy channel	L-8 learn the concept of digital and analog signal transmission L-9 Learn about the various methods data rate methods with examples	L-8 Images in slides and peer to peer discussion L-9 Images in slides, video lectures will be used	L-8 downloading speed to download data from internet, Connect the system to exchange data L-9 Wifi, wireless and jamming of signals network
Week 4	Lecture 10	PHYSICAL LAYER: Signal & Media(Transmission Impairments and Performance)	T-1	RW-1 AV-1	Describes the Transmission impairment issues and guided and unguided media	Learn about the Transmission impairment issues during transmission as well as guided and unguided media	Images in slides, peer to peer discussion	Disturbance while listening radio
		PHYSICAL LAYER: Signal & Media(Transmission media like Guided and Unguided media)	T-1	RW-1 AV-1	Describes the Transmission impairment issues and guided and unguided media. Also cabling standards need to be discuss.	Learn about the Transmission impairment issues during transmission as well as guided and unguided media	Images in slides, peer to peer discussion	Disturbance while listening radio
		PHYSICAL LAYER: Signal & Media(Cabling standards)	T-1	RW-1 AV-1	Describes the Transmission impairment issues and guided and unguided media. Also cabling standards need to be discuss.	Learn about the Transmission impairment issues during transmission as well as guided and unguided media	Images in slides, peer to peer discussion	Disturbance while listening radio

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 4	Lecture 11	PHYSICAL LAYER: Modulation & Multiplexing (Digital to Digital Conversion)	T-1	RW-1	L-11: Describes the Line coding technique (NRZ, NRZ-L, NRZ-I, RZ, manchaster and differential manchaster) L- 12: PCM and analog to analog conversion Technique L-13:Describes the modulation technique (ASK,PSK,FSK)	L-11 Learn about line coding techniques L-12 Learn about the PCM and AM, FM and PM techniques L-13 Learn about the digital to analog conversion methods	L-11 images in slides and peer to peer discussion L-12 images in slides and brain storming L-13 video lecture and images in slides will be used	L-11 Binary data encoded into signals L-12 Modem, Telephone network L-13 Cable TV network
		PHYSICAL LAYER: Modulation & Multiplexing (Analog to Digital Conversion)	T-1	RW-1	L-11: Describes the Line coding technique (NRZ, NRZ-L, NRZ-I, RZ, manchaster and differential manchaster) L- 12: PCM and analog to analog conversion Technique L-13:Describes the modulation technique (ASK,PSK,FSK)	L-11 Learn about line coding techniques L-12 Learn about the PCM and AM, FM and PM techniques L-13 Learn about the digital to analog conversion methods	L-11 images in slides and peer to peer discussion L-12 images in slides and brain storming L-13 video lecture and images in slides will be used	L-11 Binary data encoded into signals L-12 Modem, Telephone network L-13 Cable TV network
		PHYSICAL LAYER: Modulation & Multiplexing (Analog to Analog conversion)	T-1	RW-1	L-11: Describes the Line coding technique (NRZ, NRZ-L, NRZ-I, RZ, manchaster and differential manchaster) L- 12: PCM and analog to analog conversion Technique L-13:Describes the modulation technique (ASK,PSK,FSK)	L-11 Learn about line coding techniques L-12 Learn about the PCM and AM, FM and PM techniques L-13 Learn about the digital to analog conversion methods	L-11 images in slides and peer to peer discussion L-12 images in slides and brain storming L-13 video lecture and images in slides will be used	L-11 Binary data encoded into signals L-12 Modem, Telephone network L-13 Cable TV network
		PHYSICAL LAYER: Modulation & Multiplexing (Digital to Analog conversion)	T-1	RW-1	L-11: Describes the Line coding technique (NRZ, NRZ-L, NRZ-I, RZ, manchaster and differential manchaster) L- 12: PCM and analog to analog conversion Technique L-13:Describes the modulation technique (ASK,PSK,FSK)	L-11 Learn about line coding techniques L-12 Learn about the PCM and AM, FM and PM techniques L-13 Learn about the digital to analog conversion methods	L-11 images in slides and peer to peer discussion L-12 images in slides and brain storming L-13 video lecture and images in slides will be used	L-11 Binary data encoded into signals L-12 Modem, Telephone network L-13 Cable TV network

Week 4	Lecture 12	PHYSICAL LAYER: Modulation & Multiplexing (Digital to Digital Conversion)	T-1	RW-1	L-11: Describes the Line coding technique (NRZ, NRZ-L, NRZ-I, RZ, manchaster and differential manchaster) L- 12: PCM and analog to analog conversion Technique L-13:Describes the modulation technique (ASK,PSK,FSK)	L-11 Learn about line coding techniques L-12 Learn about the PCM and AM, FM and PM techniques L-13 Learn about the digital to analog conversion methods	L-11 images in slides and peer to peer discussion L-12 images in slides and brain storming L-13 video lecture and images in slides will be used	L-11 Binary data encoded into signals L-12 Modem, Telephone network L-13 Cable TV network
		PHYSICAL LAYER: Modulation & Multiplexing (Analog to Digital Conversion)	T-1	RW-1	L-11: Describes the Line coding technique (NRZ, NRZ-L, NRZ-I, RZ, manchaster and differential manchaster) L- 12: PCM and analog to analog conversion Technique L-13:Describes the modulation technique (ASK,PSK,FSK)	L-11 Learn about line coding techniques L-12 Learn about the PCM and AM, FM and PM techniques L-13 Learn about the digital to analog conversion methods	L-11 images in slides and peer to peer discussion L-12 images in slides and brain storming L-13 video lecture and images in slides will be used	L-11 Binary data encoded into signals L-12 Modem, Telephone network L-13 Cable TV network
		PHYSICAL LAYER: Modulation & Multiplexing (Analog to Analog conversion)	T-1	RW-1	L-11: Describes the Line coding technique (NRZ, NRZ-L, NRZ-I, RZ, manchaster and differential manchaster) L- 12: PCM and analog to analog conversion Technique L-13:Describes the modulation technique (ASK,PSK,FSK)	L-11 Learn about line coding techniques L-12 Learn about the PCM and AM, FM and PM techniques L-13 Learn about the digital to analog conversion methods	L-11 images in slides and peer to peer discussion L-12 images in slides and brain storming L-13 video lecture and images in slides will be used	L-11 Binary data encoded into signals L-12 Modem, Telephone network L-13 Cable TV network
		PHYSICAL LAYER: Modulation & Multiplexing (Digital to Analog conversion)	T-1	RW-1	L-11: Describes the Line coding technique (NRZ, NRZ-L, NRZ-I, RZ, manchaster and differential manchaster) L- 12: PCM and analog to analog conversion Technique L-13:Describes the modulation technique (ASK,PSK,FSK)	L-11 Learn about line coding techniques L-12 Learn about the PCM and AM, FM and PM techniques L-13 Learn about the digital to analog conversion methods	L-11 images in slides and peer to peer discussion L-12 images in slides and brain storming L-13 video lecture and images in slides will be used	L-11 Binary data encoded into signals L-12 Modem, Telephone network L-13 Cable TV network

Week	Lecture	Topic						
Week 5	Lecture 13	PHYSICAL LAYER: Modulation & Multiplexing (Digital to Digital Conversion)	T-1	RW-1	L-11: Describes the Line coding technique (NRZ, NRZ-L, NRZ-I, RZ, manchaster and differential manchaster) L- 12: PCM and analog to analog conversion Technique L-13:Describes the modulation technique (ASK,PSK,FSK)	L-11 Learn about line coding techniques L-12 Learn about the PCM and AM, FM and PM techniques L-13 Learn about the digital to analog conversion methods	L-11 images in slides and peer to peer discussion L-12 images in slides and brain storming L-13 video lecture and images in slides will be used	L-11 Binary data encoded into signals L-12 Modem, Telephone network L-13 Cable TV network
		PHYSICAL LAYER: Modulation & Multiplexing (Analog to Digital Conversion)	T-1	RW-1	L-11: Describes the Line coding technique (NRZ, NRZ-L, NRZ-I, RZ, manchaster and differential manchaster) L- 12: PCM and analog to analog conversion Technique L-13:Describes the modulation technique (ASK,PSK,FSK)	L-11 Learn about line coding techniques L-12 Learn about the PCM and AM, FM and PM techniques L-13 Learn about the digital to analog conversion methods	L-11 images in slides and peer to peer discussion L-12 images in slides and brain storming L-13 video lecture and images in slides will be used	L-11 Binary data encoded into signals L-12 Modem, Telephone network L-13 Cable TV network
		PHYSICAL LAYER: Modulation & Multiplexing (Analog to Analog conversion)	T-1	RW-1	L-11: Describes the Line coding technique (NRZ, NRZ-L, NRZ-I, RZ, manchaster and differential manchaster) L- 12: PCM and analog to analog conversion Technique L-13:Describes the modulation technique (ASK,PSK,FSK)	L-11 Learn about line coding techniques L-12 Learn about the PCM and AM, FM and PM techniques L-13 Learn about the digital to analog conversion methods	L-11 images in slides and peer to peer discussion L-12 images in slides and brain storming L-13 video lecture and images in slides will be used	L-11 Binary data encoded into signals L-12 Modem, Telephone network L-13 Cable TV network
		PHYSICAL LAYER: Modulation & Multiplexing (Digital to Analog conversion)	T-1	RW-1	L-11: Describes the Line coding technique (NRZ, NRZ-L, NRZ-I, RZ, manchaster and differential manchaster) L- 12: PCM and analog to analog conversion Technique L-13:Describes the modulation technique (ASK,PSK,FSK)	L-11 Learn about line coding techniques L-12 Learn about the PCM and AM, FM and PM techniques L-13 Learn about the digital to analog conversion methods	L-11 images in slides and peer to peer discussion L-12 images in slides and brain storming L-13 video lecture and images in slides will be used	L-11 Binary data encoded into signals L-12 Modem, Telephone network L-13 Cable TV network
	Lecture 14	PHYSICAL LAYER: Modulation & Multiplexing (Multiplexing)	T-1		Describes the multiplexing (FDM,TDM and its types)	Learn about the multiplexing and importance in data communication	video lecture and images in slides will be used	PSTN
	Lecture 15				Online Assignment			

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 6	Lecture 16	DATA LINK LAYER(Data link Layer design issues)	T-1	RW-2	Describes bout the working of switch along with the design related issues in data link layer	Learn about the design issues of data link layer	Images in slides, peer to peer discussion	sender speed need to synchronize with receiver, uplifting and down lifting water from tank
		DATA LINK LAYER(Error Detection and Correction-Hamming code, CRC, Parity, Checksum)	T-1	RW-2	Describes about the various error deduction and correction methods	Learn about error deduction and correction methods	Images in slides, peer to peer discussion	Hamming code
		DATA LINK LAYER (Switch working)	T-1	RW-2	Describes bout the working of switch along with the design related issues in data link layer	Learn about the design issues of data link layer	Images in slides, peer to peer discussion	sender speed need to synchronize with receiver, uplifting and down lifting water from tank
	Lecture 17	DATA LINK LAYER (Elementary Datalink Protocols)	T-1	RW-1 AV-1	Describes the Simplex Stop and wait for noisy and noiseless channel, describes the sliding window protocol like go back n and selective repeat protocol	Learn about the flow control and error control protocol like stop and wait, stop and wait ARQ and error control protocol like go back n and selective repeat protocol	Images of stop and wait protocol for noisy and noiseless channel, Peer to peer discussion and images of Go back n and selective repeat protocol in slides, Peer to peer discussion	a) one person talking to other over mobile phone, while other is listening so once one person completed after that listener will respond or sender will wait for respond of other person b) person can send the bulk of data at a time with out waiting respond from other person

Week	Lecture	Topic				Learning Outcome	Learning Objective		Real life application
Week 6	Lecture 18	DATA LINK LAYER (Elementary Datalink Protocols)	T-1		RW-1 AV-1	Describes the Simplex Stop and wait for noisy and noiseless channel, describes the sliding window protocol like go back n and selective repeat protocol	Learn about the flow control and error control protocol like stop and wait, stop and wait ARQ and error control protocol like go back n and selective repeat protocol	Images of stop and wait protocol for noisy and noiseless channel, Peer to peer discussion and images of Go back n and selective repeat protocol in slides, Peer to peer discussion	a) one person talking to other over mobile phone, while other is listening so once one person completed after that listener will respond or sender will wait for respond of other person b) person can send the bulk of data at a time with out waiting respond from other person
Week 7	Lecture 19	MAC SUBLAYER(Multiple Access Protocols- ALOHA, CSMA and CSMA/CD)	T-1		RW-1	Describe the random access protocol like the CSMA/CD and CSMA/CA along with the controlled access methods like the reservation and polling	Learn the CSMA and CSMA/CD protocol	Brain storming and Images in slides	Crossing the road with out looking traffic
		MAC SUBLAYER(Random Access)	T-1		RW-1	Describe the random access protocol like the CSMA/CD and CSMA/CA along with the controlled access methods like the reservation and polling	Learn the CSMA and CSMA/CD protocol	Brain storming and Images in slides	Crossing the road with out looking traffic
		MAC SUBLAYER (Controlled access)	T-1		RW-1	Describe the random access protocol like the CSMA/CD and CSMA/CA along with the controlled access methods like the reservation and polling	Learn the CSMA and CSMA/CD protocol	Brain storming and Images in slides	Crossing the road with out looking traffic
		MAC SUBLAYER(Ethernet protocol)	T-1		RW-1	Describe the random access protocol like the CSMA/CD and CSMA/CA along with the controlled access methods like the reservation and polling	Learn the CSMA and CSMA/CD protocol	Brain storming and Images in slides	Crossing the road with out looking traffic

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

				SPILL OVER			
Week 7	Lecture 21			Spill Over			
				MID-TERM			
Week 8	Lecture 22	NETWORK LAYER: IP Addressing(Network layer design issue)	T-1	RW-1 AV-1	Describes the Network layer design issues and network layer services	Learn about the network layer issues and services	Images in slides and video lecture will be used	
		NETWORK LAYER: IP Addressing(Network layer services)	T-1	RW-1 AV-1	Describes the Network layer design issues and network layer services	Learn about the network layer issues and services	Images in slides and video lecture will be used	
	Lecture 23	NETWORK LAYER: IP Addressing(IP Addressing Both Classfull and Classless)	T-1	RW-1 SW-1 AV-1	Describes the Classfull and class less IP addressing along with network layer performance metrics like the delay, throughput and packet loss	Learn about the basics of classfull and classless IP addressing. Also student will know about the metrics for the network design	Images in slides and use of white board	VOIP, hotstar
		NETWORK LAYER: IP Addressing(Network layer performance)	T-1	RW-1 SW-1 AV-1	Describes the Classfull and class less IP addressing along with network layer performance metrics like the delay, throughput and packet loss	Learn about the basics of classfull and classless IP addressing. Also student will know about the metrics for the network design	Images in slides and use of white board	VOIP, hotstar
		NETWORK LAYER: IP Addressing(Forwarding of IP packets)	T-1	RW-1 SW-1 AV-1	Describes the Classfull and class less IP addressing along with network layer performance metrics like the delay, throughput and packet loss	Learn about the basics of classfull and classless IP addressing. Also student will know about the metrics for the network design	Images in slides and use of white board	VOIP, hotstar
	Lecture 24	NETWORK LAYER: IP Addressing(Subnetting and Supernetting)	T-1	RW-1 SW-2 AV-1 AV-2	L- 24: Describes the idea of subnetting as well as solve example based on subnetting. L-25: Also the basic description of IP header with IPv6 addressing is described	L-24 Learn the concept of subnetting and solve problem based on it L25- IP header fields and the working of IPv6	Use of white board to solve problems and ask students to solve problem	VLAN, Private IP addressing

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 8	Lecture 24	NETWORK LAYER: IP Addressing(Subnetting examples)	T-1	RW-1 SW-2 AV-1 AV-2	L- 24: Describes the idea of subnetting as well as solve example based on subnetting. L-25: Also the basic description of IP header with IPv6 addressing is described	L-24 Learn the concept of subnetting and solve problem based on it L25- IP header fields and the working of IPv6	Use of white board to solve problems and ask students to solve problem	VLAN, Private IP addressing
		NETWORK LAYER: IP Addressing(IP Header)	T-1	RW-1 SW-2 AV-1 AV-2	L- 24: Describes the idea of subnetting as well as solve example based on subnetting. L-25: Also the basic description of IP header with IPv6 addressing is described	L-24 Learn the concept of subnetting and solve problem based on it L25- IP header fields and the working of IPv6	Use of white board to solve problems and ask students to solve problem	VLAN, Private IP addressing
		NETWORK LAYER: IP Addressing(IPv6 addressing)	T-1	RW-1 SW-2 AV-1 AV-2	L- 24: Describes the idea of subnetting as well as solve example based on subnetting. L-25: Also the basic description of IP header with IPv6 addressing is described	L-24 Learn the concept of subnetting and solve problem based on it L25- IP header fields and the working of IPv6	Use of white board to solve problems and ask students to solve problem	VLAN, Private IP addressing
Week 9	Lecture 25	NETWORK LAYER: IP Addressing(Subnetting and Supernetting)	T-1	RW-1 SW-2 AV-1 AV-2	L- 24: Describes the idea of subnetting as well as solve example based on subnetting. L-25: Also the basic description of IP header with IPv6 addressing is described	L-24 Learn the concept of subnetting and solve problem based on it L25- IP header fields and the working of IPv6	Use of white board to solve problems and ask students to solve problem	VLAN, Private IP addressing
		NETWORK LAYER: IP Addressing(Subnetting examples)	T-1	RW-1 SW-2 AV-1 AV-2	L- 24: Describes the idea of subnetting as well as solve example based on subnetting. L-25: Also the basic description of IP header with IPv6 addressing is described	L-24 Learn the concept of subnetting and solve problem based on it L25- IP header fields and the working of IPv6	Use of white board to solve problems and ask students to solve problem	VLAN, Private IP addressing

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week	Lecture	Topic				Details	Outcome	Methodology	Additional
Week 9	Lecture 25	NETWORK LAYER: IP Addressing(IP Header)	T-1	RW-1 SW-2 AV-1 AV-2		L- 24: Describes the idea of subnetting as well as solve example based on subnetting. L-25: Also the basic description of IP header with IPv6 addressing is described	L-24 Learn the concept of subnetting and solve problem based on it L25- IP header fields and the working of IPv6	Use of white board to solve problems and ask students to solve problem	VLAN, Private IP addressing
		NETWORK LAYER: IP Addressing(IPv6 addressing)	T-1	RW-1 SW-2 AV-1 AV-2		L- 24: Describes the idea of subnetting as well as solve example based on subnetting. L-25: Also the basic description of IP header with IPv6 addressing is described	L-24 Learn the concept of subnetting and solve problem based on it L25- IP header fields and the working of IPv6	Use of white board to solve problems and ask students to solve problem	VLAN, Private IP addressing
	Lecture 26					Online Assignment			
	Lecture 27	NETWORK LAYER: Routing(Routing algorithms)	T-1	RW-1		L-27: Describes the basics of routing and types L-28: Description of unicast routing algo like the RIP, OSPF, BGP in-terms of only metrics and advantages	Students will aware about the routing basics and the metrics associated with them	PPT and the animations for demonstrating the routing	
		NETWORK LAYER: Routing(Unicast routing protocols)	T-1	RW-1		L-27: Describes the basics of routing and types L-28: Description of unicast routing algo like the RIP, OSPF, BGP in-terms of only metrics and advantages	Students will aware about the routing basics and the metrics associated with them	PPT and the animations for demonstrating the routing	
Week 10	Lecture 28	NETWORK LAYER: Routing(Routing algorithms)	T-1	RW-1		L-27: Describes the basics of routing and types L-28: Description of unicast routing algo like the RIP, OSPF, BGP in-terms of only metrics and advantages	Students will aware about the routing basics and the metrics associated with them	PPT and the animations for demonstrating the routing	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 10	Lecture 28	NETWORK LAYER: Routing(Unicast routing protocols)	T-1	RW-1	L-27: Describes the basics of routing and types L-28: Description of unicast routing algo like the RIP, OSPF, BGP in-terms of only metrics and advantages	Students will aware about the routing basics and the metrics associated with them	PPT and the animations for demonstrating the routing	
	Lecture 29	NETWORK LAYER: Routing(Routing Algorithm-Shortest path algorithm)	T-1 R-1	RW-1	L-29: Describes the optimality principle, shortest path algorithm, flooding L-30: Describes the distance vector, link state algorithm	L-29 Learn about the types of routing algorithm and flooding L-30 Learn about the distance vector, link state algorithm	L-29 Images in slides, peer to peer discussion L-30 Images in slides as well as use white board to form routing table	L-29 Transfer of data from one organization to other by using internet L-30 Transfer of data from one organization to other by using internet and illustrate how routing is performed in scenario
		NETWORK LAYER: Routing(Distance vector Routing)	T-1 R-1	RW-1	L-29: Describes the optimality principle, shortest path algorithm, flooding L-30: Describes the distance vector, link state algorithm	L-29 Learn about the types of routing algorithm and flooding L-30 Learn about the distance vector, link state algorithm	L-29 Images in slides, peer to peer discussion L-30 Images in slides as well as use white board to form routing table	L-29 Transfer of data from one organization to other by using internet L-30 Transfer of data from one organization to other by using internet and illustrate how routing is performed in scenario

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 10	Lecture 29	NETWORK LAYER: Routing(Link State routing)	T-1 R-1	RW-1	L-29: Describes the optimality principle, shortest path algorithm, flooding L-30: Describes the distance vector, link state algorithm	L-29 Learn about the types of routing algorithm and flooding L-30 Learn about the distance vector, link state algorithm	L-29 Images in slides, peer to peer discussion L-30 Images in slides as well as use white board to form routing table	L-29 Transfer of data from one organization to other by using internet L-30 Transfer of data from one organization to other by using internet and illustrate how routing is performed in scenario
	Lecture 30	NETWORK LAYER: Routing(Routing Algorithm-Shortest path algorithm)	T-1 R-1	RW-1	L-29: Describes the optimality principle, shortest path algorithm, flooding L-30: Describes the distance vector, link state algorithm	L-29 Learn about the types of routing algorithm and flooding L-30 Learn about the distance vector, link state algorithm	L-29 Images in slides, peer to peer discussion L-30 Images in slides as well as use white board to form routing table	L-29 Transfer of data from one organization to other by using internet L-30 Transfer of data from one organization to other by using internet and illustrate how routing is performed in scenario
		NETWORK LAYER: Routing(Distance vector Routing)	T-1 R-1	RW-1	L-29: Describes the optimality principle, shortest path algorithm, flooding L-30: Describes the distance vector, link state algorithm	L-29 Learn about the types of routing algorithm and flooding L-30 Learn about the distance vector, link state algorithm	L-29 Images in slides, peer to peer discussion L-30 Images in slides as well as use white board to form routing table	L-29 Transfer of data from one organization to other by using internet L-30 Transfer of data from one organization to other by using internet and illustrate how routing is performed in scenario

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 10	Lecture 30	NETWORK LAYER: Routing(Link State routing)	T-1 R-1	RW-1	L-29: Describes the optimality principle, shortest path algorithm, flooding L-30: Describes the distance vector, link state algorithm	L-29 Learn about the types of routing algorithm and flooding L-30 Learn about the distance vector, link state algorithm	L-29 Images in slides, peer to peer discussion L-30 Images in slides as well as use white board to form routing table	L-29 Transfer of data from one organization to other by using internet L-30 Transfer of data from one organization to other by using internet and illustrate how routing is performed in scenario
Week 11	Lecture 31	NETWORK LAYER: Congestion Control (Congestion Control Algorithms)	T-1 R-1	RW-1 RW-2	L-31: Describe the congestion,congestion control, approaches to congestion control (Network provisioning,traffic aware routing,admission control) and Describe the approaches to congestion control algorithm (Traffic throttling, choke packet, hop by hop back pressure) L-32 :Describes the quality of service, traffic shaping, leaky bucket, token bucket, packet scheduling (FIFO, round robin, weighted fair queueing)	L-31Learn about the congestion and methods to control the congestion in network and also Learn about the methods to control the congestion in network L-32 Learn about the quality of service and methods to maintain quality of service in network	L-31Images in slides and peer to peer discussion L-32 congestion control methods Images, peer to peer discussion, brain storming	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 11	Lecture 32	NETWORK LAYER: Congestion Control (Congestion Control Algorithms)	T-1 R-1	RW-1 RW-2	L-31: Describe the congestion,congestion control, approaches to congestion control (Network provisioning,traffic aware routing,admission control) and Describe the approaches to congestion control algorithm (Traffic throttling, choke packet, hop by hop back pressure) L-32 :Describes the quality of service, traffic shaping, leaky bucket, token bucket, packet scheduling (FIFO, round robin, weighted fair queueing)	L-31Learn about the congestion and methods to control the congestion in network and also Learn about the methods to control the congestion in network L-32 Learn about the quality of service and methods to maintain quality of service in network	L-31Images in slides and peer to peer discussion L-32 congestion control methods Images, peer to peer discussion, brain storming	
	Lecture 33	TRANSPORT LAYER (Transport Layer Services)	T-1 R-1	RW-1 RW-2 AV-1	L-33 : Abstract of the transport layer services and classification of Port number, connection oriented and connection-less communication (overview only) L-34:Describes TCP and UDP header format, three way handshaking (overview only)	L33 - Learn about the services provided by transport layer, connection oriented and connection-less communication L34 - Learn about the Importance of TCP and UDP header fields and handshaking operation	L-33 Image of TCP header, peer to peer discussion L-34 Image of TCP and UDP header, Images of three way Handshaking operation, peer to peer discussion	file transfer between two system using internet L-
		TRANSPORT LAYER (TCP- Header format and handshaking operation)	T-1 R-1	RW-1 RW-2 AV-1	L-33 : Abstract of the transport layer services and classification of Port number, connection oriented and connection-less communication (overview only) L-34:Describes TCP and UDP header format, three way handshaking (overview only) and UDP header	L33 - Learn about the services provided by transport layer, connection oriented and connection-less communication L34 - Learn about the Importance of TCP and UDP header fields and handshaking operation	L-33 Image of TCP header, peer to peer discussion L-34 Image of TCP and UDP header, Images of three way Handshaking operation, peer to peer discussion	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week 11	Lecture 33	TRANSPORT LAYER (UDP- Header format)	T-1 R-1	RW-1 RW-2 AV-1	L-33 : Abstract of the transport layer services and classification of Port number, connection oriented and connection-less communication (overview only) L-34:Describes TCP and UDP header format, three way handshaking (overview only) and UDP header	L33 - Learn about the services provided by transport layer, connection oriented and connection-less communication L34 - Learn about the Importance of TCP and UDP header fields and handshaking operation	L-33 Image of TCP header, peer to peer discussion L-34 Image of TCP and UDP header, Images of three way Handshaking operation, peer to peer discussion	
Week 12	Lecture 34	TRANSPORT LAYER (Transport Layer Services)	T-1 R-1	RW-1 RW-2 AV-1	L-33 : Abstract of the transport layer services and classification of Port number, connection oriented and connection-less communication (overview only) L-34:Describes TCP and UDP header format, three way handshaking (overview only)	L33 - Learn about the services provided by transport layer, connection oriented and connection-less communication L34 - Learn about the Importance of TCP and UDP header fields and handshaking operation	L-33 Image of TCP header, peer to peer discussion L-34 Image of TCP and UDP header, Images of three way Handshaking operation, peer to peer discussion	file transfer between two system using internet L-
		TRANSPORT LAYER (TCP- Header format and handshaking operation)	T-1 R-1	RW-1 RW-2 AV-1	L-33 : Abstract of the transport layer services and classification of Port number, connection oriented and connection-less communication (overview only) L-34:Describes TCP and UDP header format, three way handshaking (overview only) and UDP header	L33 - Learn about the services provided by transport layer, connection oriented and connection-less communication L34 - Learn about the Importance of TCP and UDP header fields and handshaking operation	L-33 Image of TCP header, peer to peer discussion L-34 Image of TCP and UDP header, Images of three way Handshaking operation, peer to peer discussion	

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.

Week	Lecture	Topic			Reading	Lecture Details	Learning Outcome	Pedagogical Tool	
Week 12	Lecture 34	TRANSPORT LAYER (UDP- Header format)	T-1 R-1	RW-1 RW-2 AV-1	L-33 : Abstract of the transport layer services and classification of Port number, connection oriented and connection-less communication (overview only) L-34:Describes TCP and UDP header format, three way handshaking (overview only) and UDP header	L33 - Learn about the services provided by transport layer, connection oriented and connection-less communication L34 - Learn about the Importance of TCP and UDP header fields and handshaking operation	L-33 Image of TCP header, peer to peer discussion L-34 Image of TCP and UDP header, Images of three way Handshaking operation, peer to peer discussion	
	Lecture 35				Online Assignment			
	Lecture 36	APPLICATION LAYER(E Mail)	T-1	RW-1 AV-1	Describes the email architecture	Learn about the email architecture	Image of Email Architecture, peer to peer discussion	
Week 13	Lecture 37	APPLICATION LAYER(E Mail)	T-1	RW-1 AV-1	Describes the email architecture	Learn about the email architecture	Image of Email Architecture, peer to peer discussion	
	Lecture 38	APPLICATION LAYER (Domain Name System)	T-1	RW-1 AV-1	Domain name system Hierarchy (Overview only)and FTP	Learn about the Domain name system hierarchy and FTP	Image of DNS server and query resolving operation	
	Lecture 39	APPLICATION LAYER (Domain Name System)	T-1	RW-1 AV-1	Domain name system Hierarchy (Overview only)and FTP	Learn about the Domain name system hierarchy and FTP	Image of DNS server and query resolving operation	
Week 14	Lecture 40	APPLICATION LAYER (FTP)	T-1	RW-1 AV-1	Domain name system Hierarchy (Overview only)and FTP	Learn about the Domain name system hierarchy and FTP	Image of DNS server and query resolving operation	
		SPILL OVER						
Week 14	Lecture 42				Spill Over			
Week 15	Lecture 43				Spill Over			
	Lecture 44				Spill Over			
	Lecture 45				Spill Over			

An instruction plan is only a tentative plan. The teacher may make some changes in his/her teaching plan. The students are advised to use syllabus for preparation of all examinations. The students are expected to keep themselves updated on the contemporary issues related to the course. Upto 20% of the questions in any examination/Academic tasks can be asked from such issues even if not explicitly mentioned in the instruction plan.