Daffodil Polytechnic Institute, Institute Code: 50238

Lesson Plan – Academic session: October-2022 to February-2023

Subject Teacher : Md. Rajib Ahamed (Instructor)

Subject Name : Data Communication System
Subject Code 66644
Technology : Computer
Semester : 4th-A
Reference Book : *Computer Networks. By* ANDREW S. *TANENBAUM*
Text Book: Data Communication System
(Publisher: HaqueProkashani / Technical Prokashoni)

Marks	Grade Point	Letter Grade	*Marks*	Grade Point	Letter Grade
80>	4.00	A+	55-59	2.75	B-
75-79	3.75	A	50-54	2.50	C+
70-74	3.50	A-	45-49	2.25	C
65-69	3.25	B+	40-44	2.00	D
60-64	3.00	B	0-39	0.00	F

Mark Distribution (for 200 Marks)			
Theory Marks		Practical Marks	
Midterm	20	PC	25
Class test	10	PF	25
Quiz test	10	-	-
Final	60	-	-
Total	**100**	**Total**	**50**

INTENTION

AIMS

• To be able to acquire the knowledge on data communication Basics.
• To be able to provide the knowledge and to develop skill on signal and data transmission systems andtransmission media.
• To be able to acquire the knowledge on Digital communication and computer networks.
• To be able to provide the knowledge and to develop skill on network topologies and protocols.
• To be able to provide the knowledge and to develop skill on MODEM, Hub, Switch, NIC and Repeater.
• To be able to establish and implement a LAN to provide Network services.

SHORT DESCRIPTION

Communication Basics; Analog and Digital Modulation and Demodulation; Analog and Digital communication; Transmission media and connectors; LAN, Network fundamentals; Peer-peer & Client-Server techniques; Topologies and protocols; NIC; Network Addressing; IP address and Subnet Mask.

Lecture	Chapter/ Exam	Learning Area	Learning Outcome	Supporting Equipment
01	**Introduction**	Introduce subject and all chapter, Marks and Lesson Plan. Google Classroom	Student will know How to use Google Class room? Students Get Google Classroom subject code. **Class Code:**lat3wid	**Projectors & Google Classroom.** **Google Site :** https://sites.google.com/a/bsdi-bd.org/shahidulsir/subjects/data- communication-

				system66644/6th-telecommunication **https://classroom. google.com**
02	**1.Understand communication basics.**	1.1 Define Electronic Communication. 1.2 Mention the basic elements of a communication system.	Student will Understand Electronic Communication, basic elements of a communication system. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1. Classroom, Whiteeboard, Marker. 2. Projector. 3.PC with Internet.
03		1.3 Describe communication system with a simple block diagram. 1.4 State the terms: Frequency,Wavelenth ,Spectrum,Bandwidt, Throughput,propagation speed, propagation time,Noise figure & SNR	Students will know communication systemFrequency,Wavelenth,Spectrum, Bandwidth. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom, Whiteboard, Marker. 2.Projector. 3.PC with Internet.

04		1.5 Mention the difference between bandwidth and data rate. 1.6 Describe simplex,half-duplex and full duplex modes of communication. 1.7 Describe synchronous and asynchronous communication techniques.	Students will know bandwidth and data rate,simplex,half-duplex and full duplex modes of communication, synchronous and asynchronous. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1. Classroom,White board,Marker. 2. Projector. 3. PC with Internet.
05	**Review Class**	**Chapter:1(**Regarding students problem)	Students will learn How to Increase Question create Ability and Expand Answer from different source. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base/Practical 1. Classroom,White eboard,Marker. 2. Projector. 3.PC with Internet
06	**1st Quez Test**	**Chapter 1**	Students will know bandwidth and data rate,simplex,half-duplex and full duplex modes of communication,	Theory Base 1. Classroom,White board,Marker. 2. Projector.

			synchronous and asynchronous, Frequency,Wavelenth ,Spectrum, Bandwidth. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	3.PC with Internet 4. Answer scripts.
07	**2.Understand Analog communication system**	2.1 Define Modulation and Demodulation. 2.2 State the necessity of modulation.	UnderstandModulation and Demodulation. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
08		2.3 Mention the types of modulation. 2.4 Describe amplitude, Frequency and Phase modulation with necessary waveform.	Students will Know amplitude, Frequency and Phase. Student will Create Question About the Topic. Also Student will create Answer	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet

			from there Question. Group Study & Present their making topic.	
09		2.5 State the meaning of modulation index and percentage of modulation. 2.6 State the comparison of amplitude,Frequency and Phase modulation. 2.7 State the difference between analog and digital modulation	Understandamplitud e,Frequency and Phase modulation,digital modulation. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
10		2.8 Describe ASK,FSK,PSK and QPSKwith necessary waveform and bandwith. 2.9 State the advantage and disadvantages of ASK,FSK and PSK (BPSK)	UnderstandASK,FS K,PSK and QPSK. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	
11	**Review Class**	**Chapter:2(**Regarding students problem)	Students will Know amplitude, Frequency and Phase.	Theory Base/Practical 1.Classroom,White board,Marker.

			Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	2.Projector. 3.PC with Internet
12	**1st Class Test**	**Chapter 2**	Students will Know Modulation and Demodulation,amplit ude,Frequency and Phase modulation,digital modulation. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet 4. Answer scripts.
13	**3 Understand Digital communication system**	3.1 Define digital modulation. 3.2 Describe Digital communication system with block diagram.	Understand Digital communication system with block diagram. Student will Create Question About the Topic. Also Student will create Answer from there Question.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet

			Group Study & Present their making topic.	
14		3.3 Define linecoding. 3.4 Mention the catagories of Line coding	Students will learn line coding. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2. Projector. 3.PC with Internet
15		3.5 State Unipolar Linecoding with timing diagram and its drawbacks. 3.6 Describe different types of polar encoding with necessary timing diagram.	Understand Unipolar Linecoding, polar encoding Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	
16	**Review Class**	**Chapter:3(**Regarding students problem)	Students will learn How to Increase Question create Ability and Expand Answer from different source. Student will Create Question About the Topic.	Theory Base/Practical 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet

			Also Student will create Answer from there Question. Group Study & Present their making topic.	
17	**2nd Quez Test**	**Chapter 3**	Digital communication,linec oding To Learn How to give Exam quickly and Timely. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet 4. Answer scripts.
18	**4.Understand transmission media and connectors.**	4.1 Mention the catagories of. transmission media 4.2 Describe the construction of Twisted-pair (STP,UTP) Co-axial and fiberoptic cable.	Understandcatagorie s of. transmissionmedia,T wisted-pair, Co-axial and fiberoptic cable. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet

15		4.7 Describe the method of Radio,microwave and infrared communication system. 4.8 State the characteristics of Radio,microwave and infra red communication system.	Students will Know Radio,microwave and infrared communication system. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
16	**Review Class**	**Chapter:4(**Regarding students problem)	Students will learn How to Increase Question create Ability and Expand Answer from different source. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base/Practical 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
17	**2nd Class Test**	**Chapter 4**	Students will Know transmission media,Twisted-pair, Co-axial and fiberopticcable,Radio ,microwaveand infrared communication system.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet 4. Answer scripts.

			Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	
18	**5.Understand multiplexing techniques**	5.1 Define multiplexing and Demultiplexing process of communication system. 5.2 State the necessity of multiplexing.	Understandmultiple xing and Demultiplexing process of communication system. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
19		5.3 Mention the categories of multiplexing. 5.4 Define Frequency division multiplexing. 5.5 Describe Frequency division multiplexing and demultiplexing technique with block diagram	Students will know the multiplexing,demulti plexing technique with block diagram. Student will Create Question About the Topic. Also Student will create Answer from there Question.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet

			Group Study & Present their making topic.	
20		5.6 Describe the Wave division multiplexing and Demultiplexing technique with block diagram 5.7. Define Time division Multiplexing.	Students will Know the Wave division multiplexing and Demultiplexing. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
21		5.8. Describe the process of synchronous Time division Multiplexing. 5.9. Describe the principle of Code division multiplexing system.	Understand multiplexing and Demultiplexing process of communication system. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
	Review Class	**Chapter:5(**Regarding students problem)	Students will learn How to Increase Question create Ability and Expand Answer from different source.	Theory Base/Practical 1.Classroom,White board,Marker.

			Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	2.Projector. 3.PC with Internet
22	**3rdQuez Test**	**Chapter 5**	Students will Know the multiplexing and Demultiplexing. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet 4. Answer scripts.
23	**6.Understand computer network basics.**	6.1 Define Computer Network 6.2. State the concept of computer Network	Students will Know the 802 project model, IEEE 802 and OSI model. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet

24		6.3 Mention elements of computer network. 6.4 Describe the advantages of Computer network.	Students will Know the Ethernet Basic Features, 5-4-3 rule of thumb for thicknet and thinnet Ethernet LAN. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
25		6.5 Describe the application of computer network. 6.6 Describe client / server and peer-to-peer network. 6.7 Describe the general features of LAN, MANs and WANs.	Students will Know the nested interfaces, variables in interfaces, java programs. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
26	**Review Class**	**Chapter:6(**Regarding students problem)	Students will learn How to Increase Question create Ability and Expand Answer from different source.	Theory Base/Practical 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet

			Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	
28	**7.Understand the network topologies.**	7.1 Define topology. 7.2 Mention the difference between physical and logical topology.	Students will Know the working procedure of FDDI, advantages and disadvantages of using FDDI in networking. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
29		7.3 Describe the physical connection of bus, ring, star and hybrid topologies. 7.4 Mention the advantages and disadvantages of bus, ring, star and hybrid topologies.	Students will Know bus, ring, star and hybrid topologies. Student will Create Question About the Topic. Also Student will create Answer from there Question.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet

			Group Study & Present their making topic.	
30		7.5 Describe the factors to select a particular topology. 7.6Describe the logical topologies of a token ring network.	Students will Know the factors to select a particular topology. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
30	**Review Class**	**Chapter:7(**Regarding students problem)	Students will learn How to Increase Question create Ability and Expand Answer from different source. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base/Practical 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
31	**3rd Class Test**	**Chapter 7**	Students will Know bus, ring, star and hybrid topologies.	Theory Base 1.Classroom,White board,Marker. 2.Projector.

			Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	3.PC with Internet 4. Answer scripts.
32	**8.Understand network protocols.**	8.1 Define network protocol. 8.2 Describe the main elements of protocol.	Students will Know the network protocol. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
33		8.3 Describe the characteristics of protocol. 8.4 Describe the functions of protocol.	Students will Know the characteristics of protocol. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet

34		8.5 List different types of network protocols. 8.6 State the function of TCP/IP protocol.	Students will Know the function of TCP/IP protocol. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
35	**Review Class**	**Chapter:8(**Regarding students problem)	Students will Know the function of TCP/IP protocol. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base/Practical 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
36	**4thQuez Test**	**Chapter 8**	Students will learn How to Increase Question create Ability and Expand Answer from different source. Student will Create Question About the Topic. Also Student will create Answer	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet 4. Answer scripts.

			from there Question. Group Study & Present their making topic.	
37	**9. Understand IP addressing.**	9.1 Define Network Addressing. 9.2 State the format of physical address of a NIC.	Students willKnow the internetwork connectivity devices,function of Routers, CSU/DSUs and Gateways. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
38		9.3. Define IP. 9.4. Describe the IP address Formats of Class A, B, C, D, E with example.	Understand IP address. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
41	**4th Class Test**	**Chapter 9**	Students will learn How to Increase Question create Ability and Expand	Theory Base 1.Classroom,White board,Marker.

			Answer from different source. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	2.Projector. 3.PC with Internet 4. Answer scripts.
42	**10.Understand Network Interface Cards (NIC)**	10.1 State the role of NIC. 10.2 Describe the network address.	Students will know the NIC,network address. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
43		10.3 Mention the points that agree both the sending and receiving NICs. 10.4 State the importance of base memory address for NIC.	Students will know the sending and receiving, base memory address for NICs. Student will Create Question About the Topic. Also Student will create Answer from there Question.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet

			Group Study & Present their making topic.	
44		10.5 Mention the important points to maintain the compatibility among NIC, bus and cables. 10.6Describe the NIC related factors that enhanced the performance of network.	Students will know the maintain the compatibility among NIC, bus and cables. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet
50	**Review Class**	**Chapter:11** **(**Regarding students problem)	Students will learn How to Increase Question create Ability and Expand Answer from different source. Student will Create Question About the Topic. Also Student will create Answer from there Question. Group Study & Present their making topic.	Theory Base/Practical 1.Classroom,White board,Marker. 2.Projector. 3.PC with Internet

Practical

Practical Job No.	Chapter	Learning Area	Learning Outcome	Supporting Equipm
1.	**1.Identify different typesof guided communication media.**	1. Twisted Pair Cable- Unshielded Twisted Pair (UTP), Shielded Twisted Pair 2. Co-axial Cable- Thick net and Thin net	**Students will Practicaly See the all type of Cable and Connectopr.** Student will Create Question About the Topic. Also Student will try to solve the problem. Group Study & Practically Show there Practical Performance.	**Practical Base** **1.Cable-Twisted P axil,Fiber.** **2.Connector-** RJ-4 MT-RJ, LC, MTP/M **3.** Network Interfac and Crimper, Mod Switch & Router
		3. Fiber Optic Cable- Single mode and Multi 4.Constructional features of UTP, STP, Co-axial Cable and Fiber Optic Cable.	**Students will Practically see** Cable, Console cable and Patch cable. Student will Create Question About the Topic. Also Student will try to solve the problem. Group Study & Practically Show there Practical Performance.	**Practical Base** **1.Cable-Twisted P axil,Fiber.** **2.Connector-** RJ-4 MT-RJ, LC, MTP/M 3. Network Interfac and Crimper, Mod Switch & Router
2.	**2.Identify different types of connectors**	5. Twisted Pair Cable- RJ45 Connectors and 6. Co-axial Cable- BNC Connectors and their constructional 7. Fiber Optic Cable- MT-RJ and their constructional	Student will Create Question About the Topic. Also Student will try to solve the problem. Group Study & Practically Show there Practical Performance.	**Practical Base** **1.Cable-Twisted P axil,Fiber.** **2.Connector-** RJ-4 MT-RJ, LC, MTP/M 3. Network Interfac and Crimper, Mod Switch & Router

		Router	Group Study & Practically Show there Practical Performance.	3.PC with Internet 4. All Cable, Cable Accessories.
4.	**4. Configure TCP/IP to server and client PCs.**	11. Make a straight through cable 12. Make a Cross over cable 13. Make a	Student will Create Question About the Topic. Also Student will try to solve the problem. Group Study & Practically Show there Practical Performance.	Practical Base 1. Classroom, White 2. Projector. 3.PC with Internet 4. All Cable, Cable Accessories.
5.	**5. Establish a Peer to Peer/Workgroup LAN**	14. Install Network Interface Card (NIC) into the PC 15. Check the MAC address of the Network Interface Card (NIC) 16. Connect straight cable or cross over cable among PCs, Hub or Switch 17. Configure the TCP/IP in each PC 18. Test the connectivity among PCs using Ping Command.	Student will Create Question About the Topic. Also Student will try to solve the problem. Group Study & Practically Show there Practical Performance.	Practical Base 1. Classroom, White 2. Projector. 3.PC with Internet 4. All Cable, Cable Accessories.
6.	**6. Perform the task to Work with a Peer/Workgroup LAN environment for simple data communication.**	19. Share the folders, Pen drive and Secondary memory. 20. Share a printer, DVD Drive or any other resources.	Student will Create Question About the Topic. Also Student will try to solve the problem. Group Study & Practically Show there Practical Performance.	Practical Base 1. Classroom, White 2. Projector. 3.PC with Internet 4. All Cable, Cable Accessories.
7.	**7. Establish a Client–Server Local Area Network.**	21. Install Windows server 2012 into a server PC 22. Configure TCP/IP to server and client PCs 23. Perform the task to configure the Active Directory 24. Perform the task to configure The DNS. 25. Perform the task to configure the DHCP 26. Perform the task to Work with a Client–Server LAN environment for simple datacommunication	Student will Create Question About the Topic. Also Student will try to solve the problem. Group Study & Practically Show there Practical Performance.	Practical Base 1. Classroom, White 2. Projector. 3.PC with Internet 4. All Cable, Cable Accessories.

		and Administrative functions.		

REFERENCE BOOKS

1. Data communications and Networking – Behrouz A. Forouzan.
2. Fundamentals of Communication-M. Shamim Kaiser and associates
4. Data and Computer Communications-William Stallings
5. Local Area Networking – S. K Basandra.
6. MCSE Windows & Networking Essential – Joe Casad