

ALLAMA IQBAL OPEN UNIVERSITY, ISLAMABAD
(Department of Computer Science)

WARNING

1. PLAGIARISM OR HIRING OF OTHER WRITER(S) FOR SOLVING THE ASSIGNMENT WILL DEBAR THE STUDENT FROM AWARD OF DEGREE/CERTIFICATE, IF FOUND AT ANY STAGE.
2. SUBMITTING ASSIGNMENTS BORROWED OR STOLEN FROM OTHER(S) AS ONE'S OWN WILL BE PENALIZED AS DEFINED IN 'AIOU PLAGIARISM POLICY'.

Course: 3429 Data Communication and Networks
Level: MBA/PGD

Semester: Spring, 2014
Total Marks: 100

ASSIGNMENT No. 1

Units (-)

Note: All questions carry equal marks.

- Q. 1 Discuss the features of communication model and also describe the purpose of various communication tasks? (20)
- Q. 2 Define the characteristics of signal? Differentiate time and frequency domain. What is the difference between guided and unguided transmission media? (20)
- Q. 3 What is communication protocol? Explain the OSI stack model in detail with example? (20)
- Q. 4 Write short note on each of the following? (20)
- Attenuation A
 - Delay distortion D
 - Coaxial Cable C
 - Optical Fiber O

Q. 5 Differentiate digital data and digital signal? Also explain terrestrial & Satellite Microwave in detail. (20)

ASSIGNMENT No. 2

Total Marks: 100

(-)

Note: All questions carry equal marks.

Q. 1 What is LAN Network? Explain different types of LAN topologies in detail with examples. (20)

Q. 2 Discuss the characteristics of asynchronous and synchronous transmission in detail? Also explain different types of multiplexing. (20)

Q. 3 What is flow control techniques? Also define error detection and error control techniques. (20)

Q. 4 Define LAN architecture. Also describe CSMA/CD and Gigabit LANs. (20)

Q. 5 Write short notes on the following with respect to their functionality: (20)

- Passive and Active Switch P
- -Router B
- Passive and Active Bridge P
- Proxy Server P

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Course: **Data Communication and Networks**
Course Code: 3584 (Old 3429)
Level: MBA/PGD

Semester: Spring, 2014
Total Marks: 100
Credit Hours: 4(3+1)

Recommended Books	Data and Computer Communication by William Stallings fifth edition
Audio/Video/Multimedia CD:	Not Available
Reference Book:	Data Communications and Networking by Behrouz A Forouzan 3 rd edition
Pre-Requisite	None
Teaching Methodology	Online
Computer Usage	Use of Internet for exploring Communication of Data in Networks

Introduction:

This course covers; Data Transmission, Networking Concepts, Transmission Impairments, Attenuation, Delay Distortion, Noise, Channel Capacity, Transmission Media, Data Communication Interface, Data Link Control, Connectivity Devices and Connection Services, Disaster Recovery, and Network Adapter Cards.

Course Objectives:

At the end of the course the students are expected to:

1. Appraise need and importance of electronic media A
2. Become familiar with data communication devices, transmission media and standards. B
3. Learn data encoding techniques and Multiplexing L
4. Demonstrate the communication between server and terminals D
5. Develop the communication between Server and Terminals D
6. Implement the Multiplexing Techniques I
7. Become familiar with the concept of Data Encoding Techniques F

Evaluation Criteria:

i)	Assignments	10%
ii)	Mid Term Theory/Practical Examination	20%
iii)	Final Examination	70%

Moiz Ahmed, Assistant Professor, DCS
Course Coordinator

Data Communication and Networks

Course Code –3429

- Unit No.1: Data Transmission & Networking Concepts**
Communication Model, Protocols, TCP/IP Suite, OSI Seven Layer Model, Standards, LANs, LAN topologies, WANs, WAN Technologies, Simplex, Half-Duplex and Full-Duplex Transmission, Analog and Digital Data Transmission
- Unit No.2: Signal Fundamentals and Transmission Impairments**
Basics of Signals, Time Domain and Frequency Domain, Attenuation, Delay Distortion, Noise and Channel Capacity
- Unit No.3: Transmission Media**
Guided Transmission Media – Twisted Pair, Coaxial Cable and Optical Fiber, Unguided Transmission Media – Terrestrial & Satellite Microwave and Broadcast Radio.
- Unit No.4: Data Encoding**
Digital Data & Digital Signals, Encoding Techniques (NRZ-L, NRZI, Bipolar Ami, Pseudo ternary, Manchester, Differential Manchester), Digital Data & Analog Signals-Modem Encoding Techniques (ASK, FSK, PSK, QPSK), Analog Data & Digital Signals-Code Encoding Techniques (PCM, TDM), Modulation Techniques (Am, Fm, Pm)
- Unit No.5: Data Communication Interface and Multiplexing**
Asynchronous and Synchronous Transmission, Line Configurations, Interfacing, Null Modem, Frequency Division, Multiplexing, Synchronous and Statistical Time Division Multiplexing
- Unit No.6: Data Link Control**
Flow Control Techniques – Stop & Wait, Sliding Window, Error Detection (Even and Odd Parity Check, CRC or FCS), Error Control Techniques (Stop and Wait ARQ, Go-Back-N ARQ, Selective-Reject ARQ, High Level Data Link Control Protocols (HDLC)
- Unit No.7: LAN Technologies and Systems**
LAN Architecture, Ethernet and Fast Ethernet LANs (CSMA/CD), Token Ring Network, FDDI, High Speed Ethernet (Gigabit LANs)
- Unit No. 8: Inter network Devices and WAN Services**
Switch, Router, Circuit Switching Network, Packet Switching Network, ISDN Links, ATM and Frame Relay

Unit No.9: Disaster Recovery and System Configuration

Disaster Recovery, Data Protection Techniques, System Failures Protection Techniques, System Configuration, Installing and Configuring Network devices (Modem and NIC), Network Configuration and Administration

Activities

1. The institution should make arrangements for the demonstration of:
 - a. Various media devices and communication services.
 - b. Data Communication model.
 - c. Failure of data communication system.
2. Assume a data stream is made of ten 0s, Encode this stream using the following encoding schemes. How many changes (vertical line) can you find for each scheme. Polar NRZ-1, NRZ1, AM1, Manchester.
3. Consider the transmission system using Frequency Division Multiplexing. What cost factors are involved in adding one more pair of stations to the system?
4. The institution should arrange the following to make and test UTP cable from the students used in Star topology
 - (a) Direct Cable and
 - (b) Cross over Cable